

JULY 8, 1937

AGRICULTURE-ENGINEERING LIBRARY

Bureau of Business Research

JUL 9 1937

University of Pittsburgh

THE IRON AGE

APOLLO

STEEL
COMPANY

LIBRARY
WEST VIRGINIA UNIVERSITY

STEEL SHEETS

At Such A Time As This:

It is an Obligation Recognized by those
who value the

Loyalty Of Friends And Patrons
To Maintain the

- (1.) **Quality** of Products
- (2.) **Service**
- (3.) **Delivery**
As Promised and Agreed.

**Greater Efficiency and Increased
Production** has enabled us to supply,
in large measure, the wants of our
many loyal friends from the Atlantic
Seaboard to the Pacific Coast.

Sales Offices In Principal Cities

PITTSBURGH, PA., OFFICE — 2244 OLIVER BLDG.
MAIN OFFICE AND WORKS — APOLLO, PENNA.

HOT ROLLED

COLD ROLLED

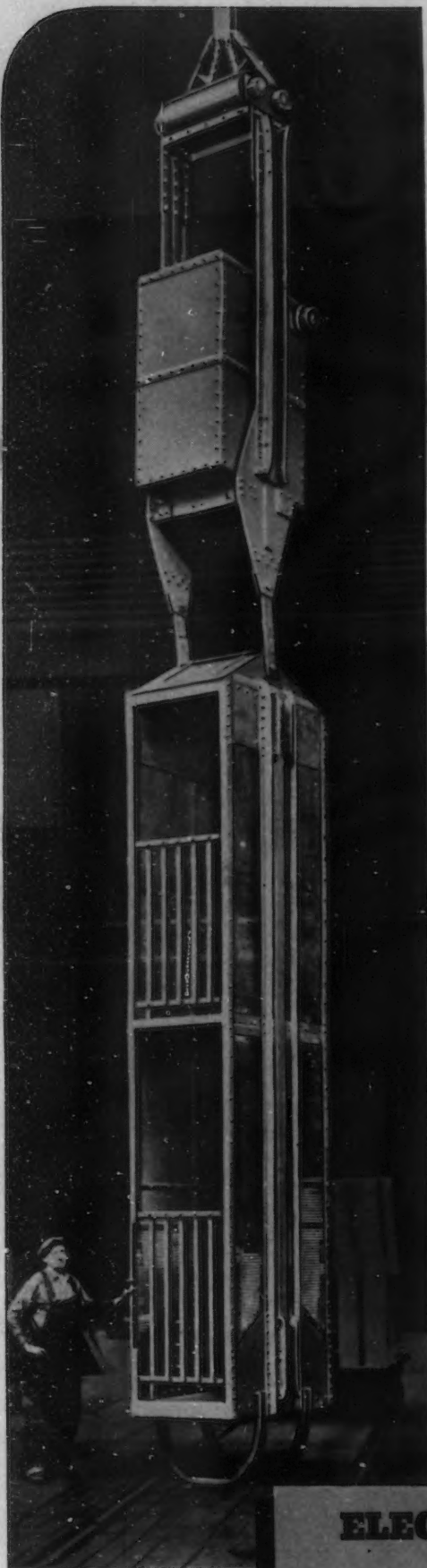
GALVANIZED
SHEETS

FORMED ROOFING
PRODUCTS



AG-ENG LIB.

ENG
IN 6
V. 140
No. 2
JL. 8, 1937



Better . . because it's *Alloy Steel*

This modern combined mine skip and hoisting cage is *better because it's alloy steel!* Made of a high-tensile mild-alloy steel containing manganese and silicon, it weighs 30 per cent less than the steel lift it replaces. This enables the mine to operate 800 feet below its present floor without overloading its hoisting machinery.

In thousands of other applications, the extra strength of alloy steels decreases dead weight, increases pay load, lowers maintenance, and lengthens life. If you want to give your equipment or product this extra value, investigate the possibilities of alloy steels.

Electromet, through thirty years' practical experience with ferro-alloys and alloy steels, can give you unbiased help in selecting the right alloy steel for your purpose. Electromet is not a manufacturer of alloy steels, and favors no one producer or product. Avail yourself of this service. You may profit and will not obligate yourself. Write for further information.

ELECTRO METALLURGICAL COMPANY

Unit of Union Carbide and Carbon Corporation

UCC

CARBIDE & CARBON BUILDING

Electromet
Ferro-Alloys & Metals

30 EAST 42nd ST., NEW YORK, N. Y.

VisControlled forging steels

*speed work.
improve the product*

It is all very well to have one lot of steel go through your forge shop successfully. It is quite another matter to put that operation on a mass-production basis and get steel all of which will go through smoothly.

Strict uniformity through heat after heat is a most important factor in forging steels. Analysis must be as specified, of course, but this does not cover all properties affecting forging. Steel must be clean, must have uniform grain structure, must be uniformly ductile at forging heat—properties which are not controlled by analysis alone.

VisControlled steel, made under Bethlehem's exclusive control system, is excellent for mass-production of forgings because these factors can't help but be uniform, one heat after another. The VisControl process largely removes variables from open-hearth furnace conditions—composition of slag, oxidation of molten-steel bath, and other technical considerations affecting the nature of the steel.

The uniformity of VisControlled forging steels will better your production schedules—you won't have to make any changes when starting on a new heat; it will cut losses; it will bring a saving in time and material. Practically all Bethlehem steels are now made under VisControl. Call in a Bethlehem metallurgist. He will apply this new control method to the making of the steel best suited to your needs. Then you are all set for a long run.

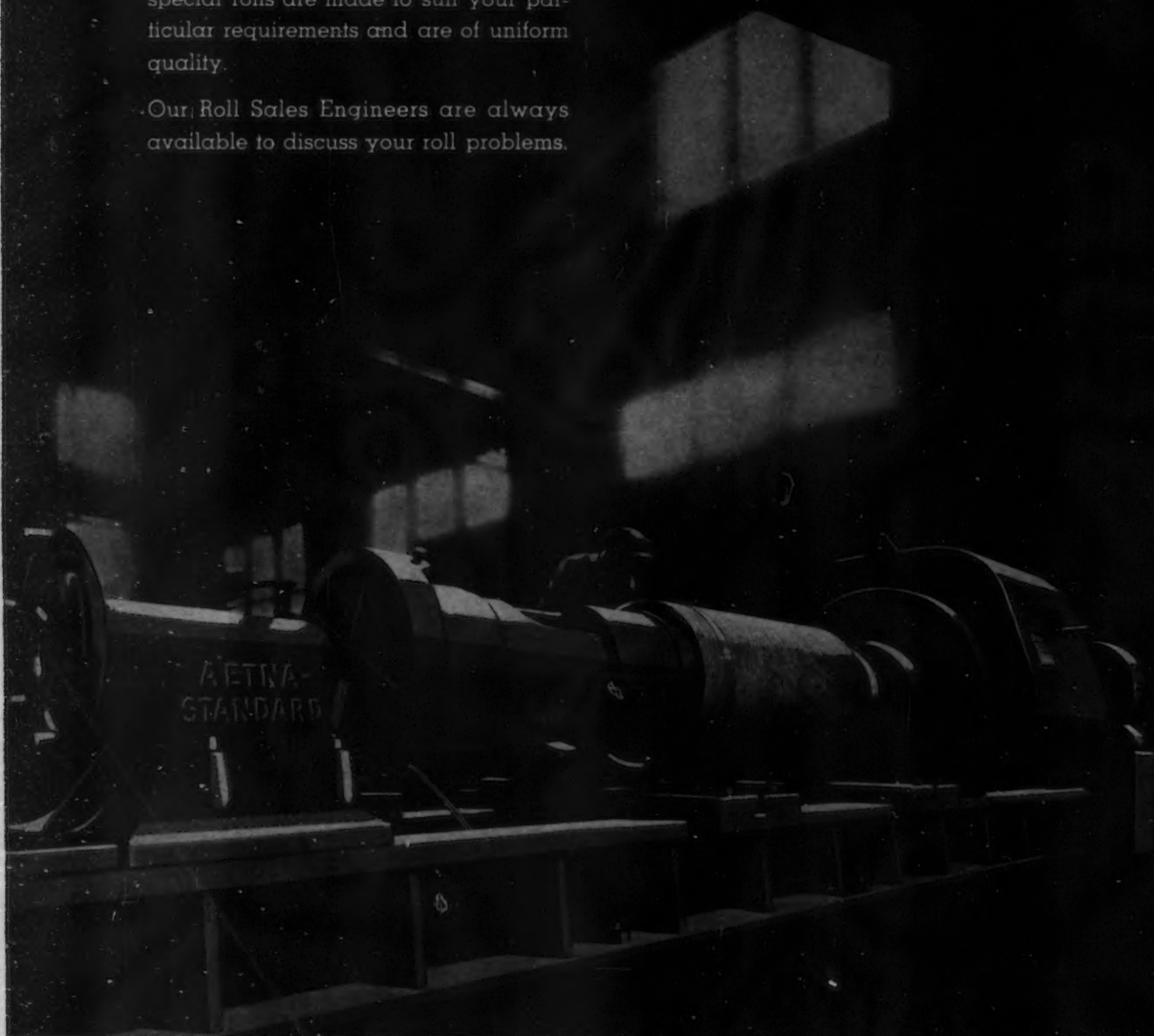


BETHLEHEM STEEL COMPANY

23 Years Experience in ROLL MAKING

Aetna-Standard sand, plain chill, molybdenum chill, ASEX grain and ASEX special rolls are made to suit your particular requirements and are of uniform quality.

Our Roll Sales Engineers are always available to discuss your roll problems.



THE AETNA-STANDARD ENGINEERING COMPANY
CONSULTANTS • DESIGNERS • BUILDERS
STEEL AND NONFERROUS INDUSTRIES
YOUNGSTOWN " OHIO " U. S. A.



**20 SCREWS CUT
BETWEEN GRINDS
WITH THIS
MILLING CUTTER OF
RED CUT SUPERIOR**

Accuracy and uninterrupted service are to be expected when Red Cut Superior is used on a job of this kind . . . milling an Acme thread, one turn in each $1\frac{1}{4}$ "; cutting ten lineal feet per grind. Cutter revolves at the rate of 210 R.P.M. Each screw has ten turns on a $1\frac{3}{8}$ " diameter.

**HE USED HIS HEAD
WHEN HE DECIDED ON
RED CUT
SUPERIOR**



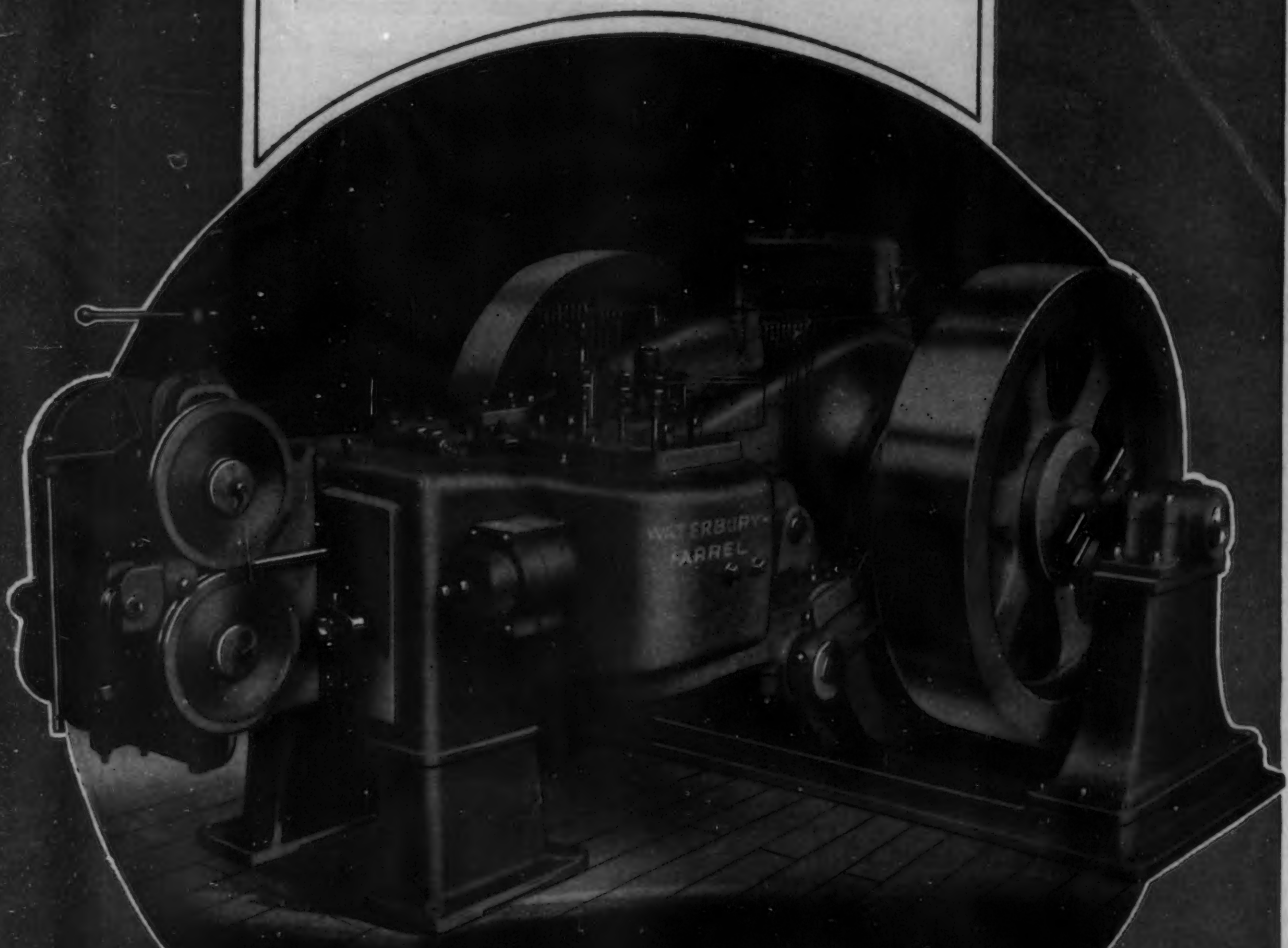
VANADIUM-ALLOYS

STEEL COMPANY

LATROBE, PA.

WATERBURY-FARREL

Headers



Open Die Double Stroke Crank Machine — Steel Frame —
Weight 85,500 pounds — Maximum Capacity 1" diam-
eter, 8 1/2" long under the head — 45 per minute.

For Bolts,
Screws,
Rivets, Rods,
Spokes and
other hard-
ened work
made by the
cold process.

THE
WATERBURY FARREL
FOUNDRY AND MACHINE
COMPANY
WATERBURY, CONNECTICUT, U.S.A.

CLEVELAND

CHICAGO

NEWARK, N. J.

Also, Thread-
ers, Trimmers,
Slotters, Nut
Machines,
Rod, Wire,
Tubing & Sheet
Metal Machin-
ery, Presses, etc.



Goodrich Sewer Ends Leaks in Waste Acid Lines

Saves money . . . speeds production . . . lasts for years

STOP leaks in your acid disposal lines—end them not for days but for years. You can do it with a Goodrich sewer, so designed by experienced engineers that the acid never touches anything but pure rubber which it cannot harm.

Goodrich sewers are made of steel pipe, lined with rubber by the inseparable Vulcalock bond. Rubber is brought around the pipe ends so that no metal is exposed to the flowing acid. At intervals in the sewer special Goodrich expansion joints are used, each capable of taking up $\frac{1}{4}$ " to $\frac{1}{2}$ " expansion in the pipe.

Disposal of waste acid has until now been a costly nuisance. Leaks were in-

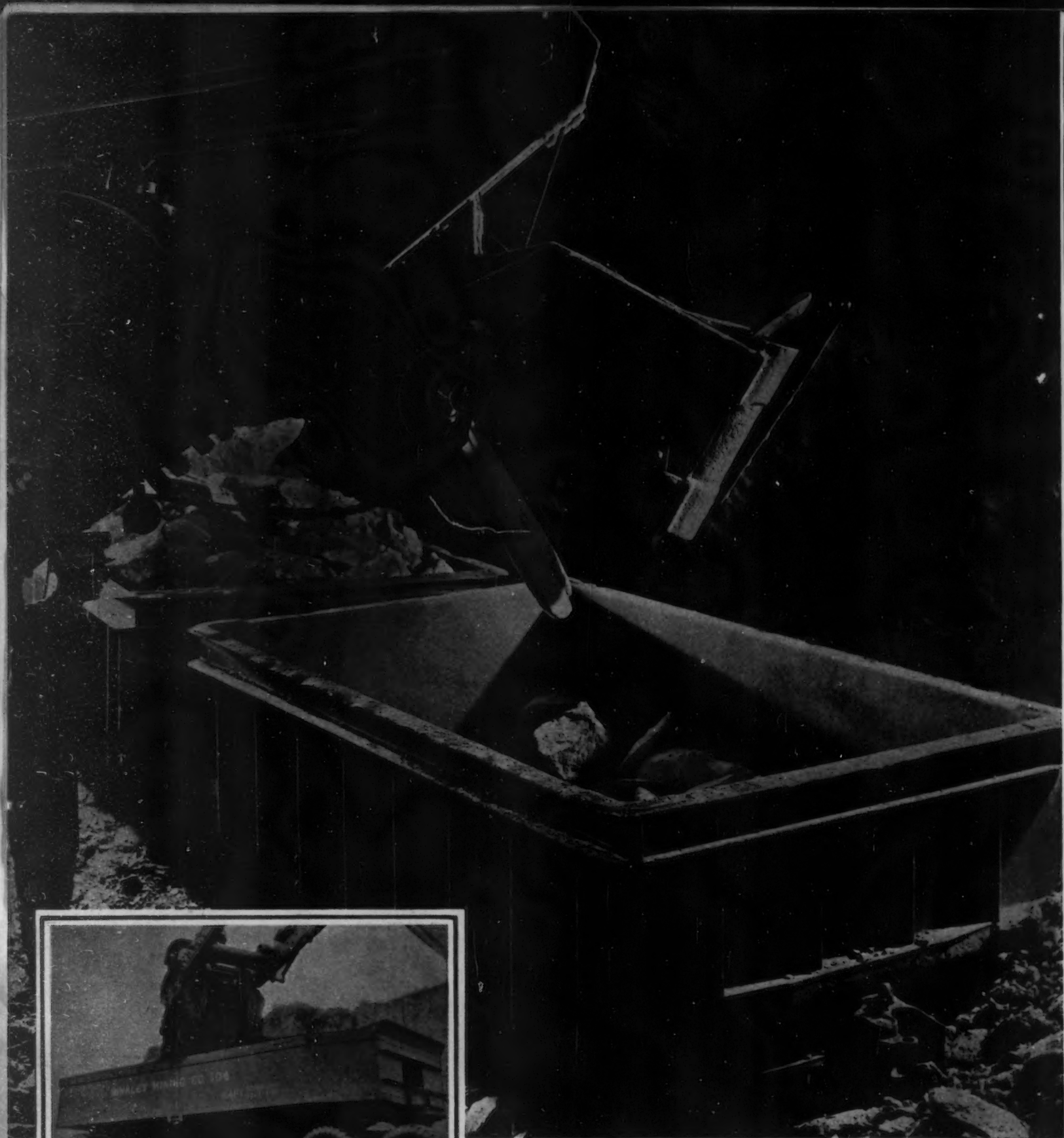
evitable, so that dangerous acid puddles were frequent, building foundations were undermined, costly repairs were often necessary. By making leaks impossible, Goodrich sewers stop all this expense, end danger to workers from acid, save money now spent on repairs, make your operation more modern and efficient, stop the unpleasant nuisance of acid fumes and unsightly puddles.

Study the Goodrich sewer and your experience will quickly show you its advantages. Goodrich sewers have been in use at Youngstown Sheet and Tube for a year and at Inland Steel and other plants for more than two years, and not a single leak has ever occurred,

not a penny has been needed for sewer repairs.

Goodrich engineers have specialized in acid handling operations for many years. They talk your production-at-a-profit language. Their experience is yours for the asking. Next time you repair or install acid handling equipment, specify Goodrich and save money. The B. F. Goodrich Company, Mechanical Rubber Goods Division, Akron, Ohio. (In Canada: Canadian Goodrich Company, Ltd., Kitchener, Ontario.)

Goodrich
ALL products *problem* IN RUBBER



LARGEST TRAIL CAR EVER BUILT uses MAN-TEN—33 cu. yds. capacity. "In designing our Trail-cars we were confronted with the necessity for reducing weight while still using steel which would resist abrasion. MAN-TEN steel has given us entire satisfaction."

\$25 A DAY SAVING IN OPERATING COSTS. This trailer frame, built of USS High Tensile Steel, weighs 11,000 pounds, or 25% less than if built of ordinary structural steel. Its ability to haul heavier and longer loads into inaccessible places reduced hauling costs enough to pay for its construction.

INDUSTRIAL CARS like this, when constructed of USS High Tensile COR-TEN and MAN-TEN, have the extra strength that means longer life under the impact of heavy stone. Such cars not only weigh less than those built of ordinary steel but have considerably higher capacity per pound of weight. Maintenance is estimated to be less than one-third that of wooden cars.



Freed from the Drag of Dead Weight

*Equipment built of these
stronger steels shoulders industry's
loads at lower cost*

EXCESS weight does no work but you pay for it just the same. It increases power bills, raises maintenance costs, slows up production, limits capacity. It has no place in modern machinery.

Weight does not necessarily mean strength. The new, light-weight construction with USS COR-TEN, MAN-TEN, and other High Tensile Steels eliminates every unnecessary pound without loss of strength, safety or endurance. Thus it is possible to build industrial equipment as much as 30% lighter with equal capacity. This large weight reduction means greater output because lighter equipment works faster, hauls more loads per hour, with smaller motors and less power.

The increased toughness and higher resistance to abrasion of these superior steels step up service life and keep replacement costs low. COR-TEN has four to six times the atmospheric corrosion resistance of ordinary structural grades.

COR-TEN and MAN-TEN construction give more strength per pound, greater all-round efficiency — all the money-saving advantages. Now, with the price of these steels closer than ever to that of ordinary steel—the last obstacle to their general use is removed.

You can find out how much dead weight can be eliminated from your equipment and what it will cost by getting in touch with our engineers. Send us your drawings. We will be glad to assist you.



30 CUBIC YARDS AT ONE GULP! USS High Tensile Steel construction makes possible the huge capacity of this giant dipper and also gives it the added strength and abrasion resistance to withstand the grueling service. Thousands of pounds of weight eliminated by rolled steel construction enables the shovel to do more work with no extra power.

U·S·S HIGH TENSILE STEELS



AMERICAN STEEL & WIRE COMPANY, Cleveland, Chicago, and New York
CARNEGIE-ILLINOIS STEEL CORPORATION, Pittsburgh and Chicago
COLUMBIA STEEL COMPANY, San Francisco
NATIONAL TUBE COMPANY, Pittsburgh
TENNESSEE COAL, IRON & RAILROAD COMPANY, Birmingham
United States Steel Products Company, New York, Export Distributors

UNITED STATES STEEL

GOLDEN GATE BRIDGE !



WORLD'S LARGEST AND LONGEST SUSPENSION BRIDGE CABLES



THE NATION PAYS TRIBUTE

TO A GREAT ENGINEERING ACHIEVEMENT



With the entire United States battle fleet riding in San Francisco's great harbor, the mighty Golden Gate Bridge was formally dedicated and opened to traffic on May 28, 1937. ● In erecting the cables for the Golden Gate Bridge in 6 months and 9 days, Roebling spun 80,000 miles of Roebling wire (as much as 1,000 miles per day, 33 tons per hour) . . . and created an all-time speed record! ● Other Roebling Products used on the bridge or in connection with its erection, include, in part, over 38 miles of $2\frac{11}{16}$ " diameter wire rope suspenders, 808 tons of erection ropes, 1,250,000 feet (237 miles) of electric light, power, and signal wire, and 90,000 square feet of woven steel wire fabric. ● John A. Roebling's Sons Co., Trenton, New Jersey. ● Branches in Principal Cities.

CABLES SPUN BY
ROEBLING



WIRE ROPE

FLAT WIRE

WELDING WIRE

ELECTRIC WIRE

WIRE FABRIC

“Put ’er



Right There!"

EVERY batter wants the ball right down his groove . . . because he knows it is the kind he can hit for a home run. Remember this when you choose materials for manufacturing your products. Get only materials that are right "down your groove".

Take wire, for example. We are equipped to make any type, size or grade of wire which your production may require. When you specify American Quality Wire we "put it there" — exactly the way you want it. Only when you use the one wire that will do the best job for you, can you get maximum efficiency in product performance with minimum production costs.

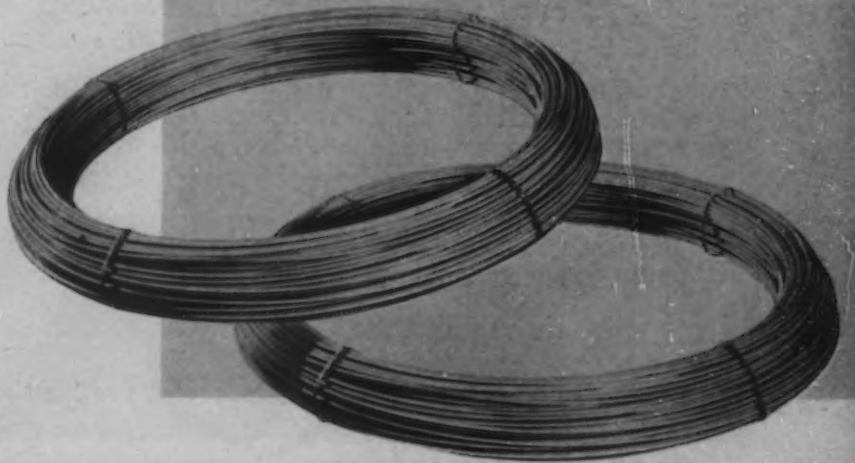
Let us help you by studying your production problems to determine which wire is best suited to give efficiency and dependability at low cost. Then let us show you that we can provide that wire in high quality that is strictly uniform.

Our engineers know wire production and understand the requirements of economical and dependable wire performance. Through their service you can take advantage of our long experience in the manufacture and application of wire products.



AMERICAN QUALITY WIRE is regularly and carefully tested for uniformity in those characteristics necessary for best performance in your product.

THESE COILS of American Quality wire, made in modern plants by experienced workmen, have behind their high quality the experience of more than a hundred years of wire-making . . . as well as the advice and scrutiny of modern research and testing laboratories.



U·S·S AMERICAN QUALITY WIRE

AMERICAN STEEL & WIRE COMPANY

Cleveland, Chicago, and New York

Columbia Steel Company, San Francisco, Pacific Coast Distributors • United States Steel Products Company, New York, Export Distributors



UNITED STATES STEEL

Highly Satisfactory!

FOR roll necks that used to get block grease, but which are now piped for central pressure system, nothing is as satisfactory as Texmill Greases.

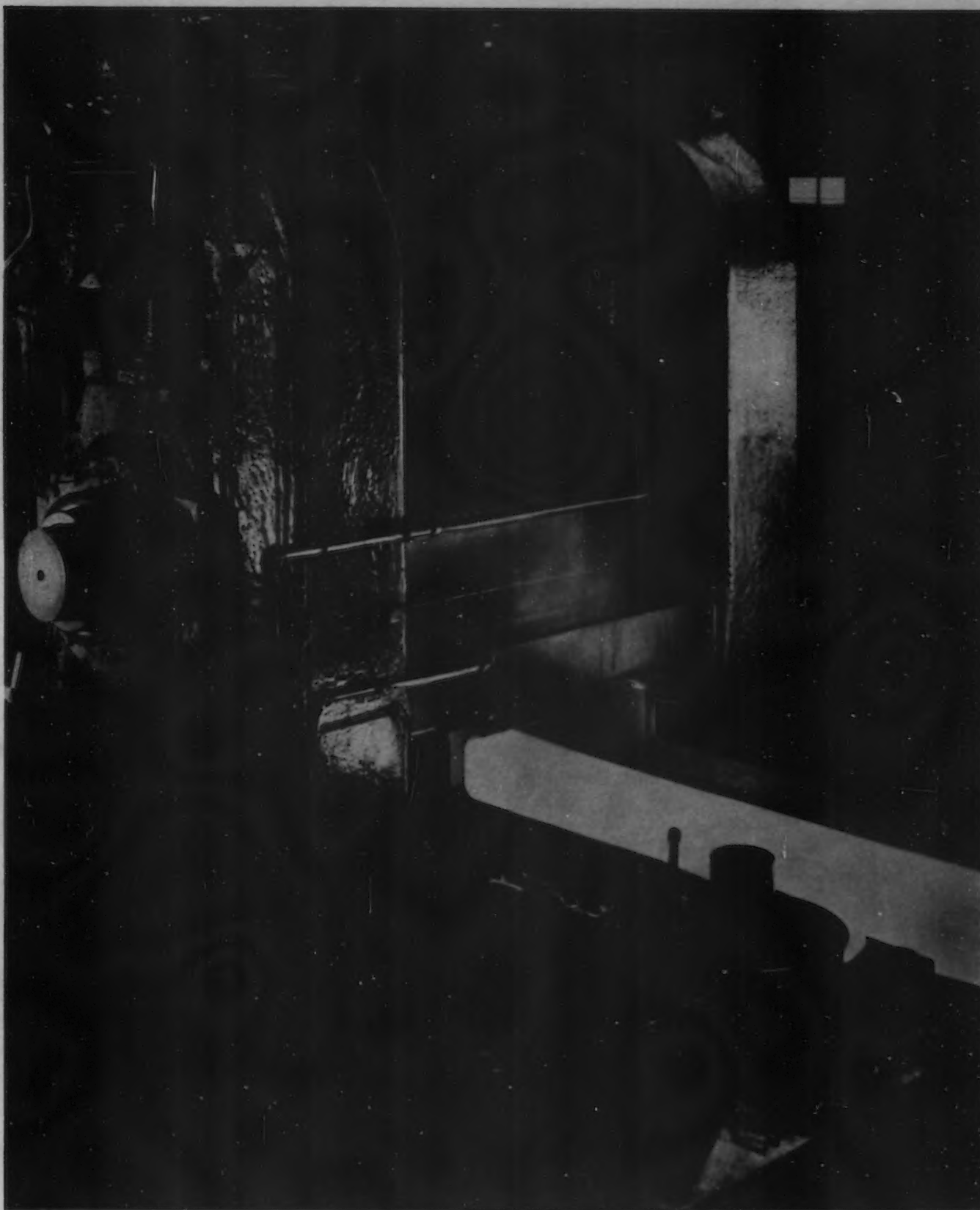
Made from the finest ingredients, including very heavy-bodied lubricating oil, plus the correct proportion of graphite, they have proved their right to first place in roll-neck lubrication.

These highly specialized Texaco greases are soft, pumpable, adhesive, heat and water resisting, yet of exceptionally high film strength. One of the country's largest pipe mills uses Texmill Greases throughout its plant . . . has for several years.

Trained lubrication engineers are available for consultation on the selection and application of Texaco Petroleum Products. Prompt deliveries assured through 2020 warehouse plants throughout the U. S. The Texas Company, 135 East 42nd Street, New York.



TEXACO



Texmill Greases come in 4 different grades, containing from 5.5% to 27.0% of graphite, penetration from 300 to 25, melting point from 200 to 220 degrees F. We are always glad to work with users having special problems to meet and master. Our vast experience is at your service.

Industrial Lubricants

THE IRON AGE, July 8, 1937—15

*Wherever you look...there's a place
for WEIRTON STEEL*



AIR conditioning, engineered heating and modern, shining household appliances all have contributed to revolutionize the part the basement plays in modern living. And in this transformation Weirton Steel has again played an important part.

Manufacturers of furniture, fixtures and home appliances—have learned that Weirton Strip and Sheets give them a splendid medium for combining beauty with utility as well as

a product that will stand the punishment demanded by the most severe draw.

Manufacturers, by the hundreds, are finding in Weirton Steel an efficient aid to the economical production which present-day conditions demand.

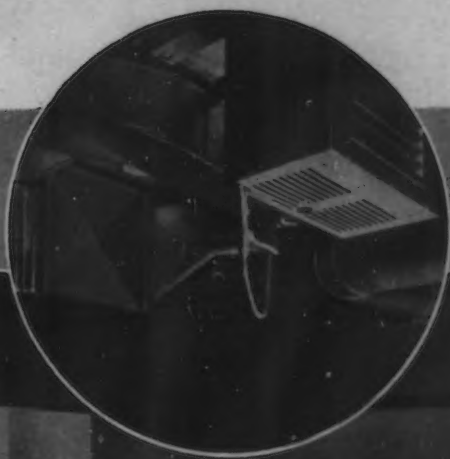
"Wherever YOU look—there's a place for Weirton Steel" . . . Made to serve your needs, and to maintain YOUR standards of quality.

WEIRTON STEEL COMPANY, WEIRTON, WEST VIRGINIA

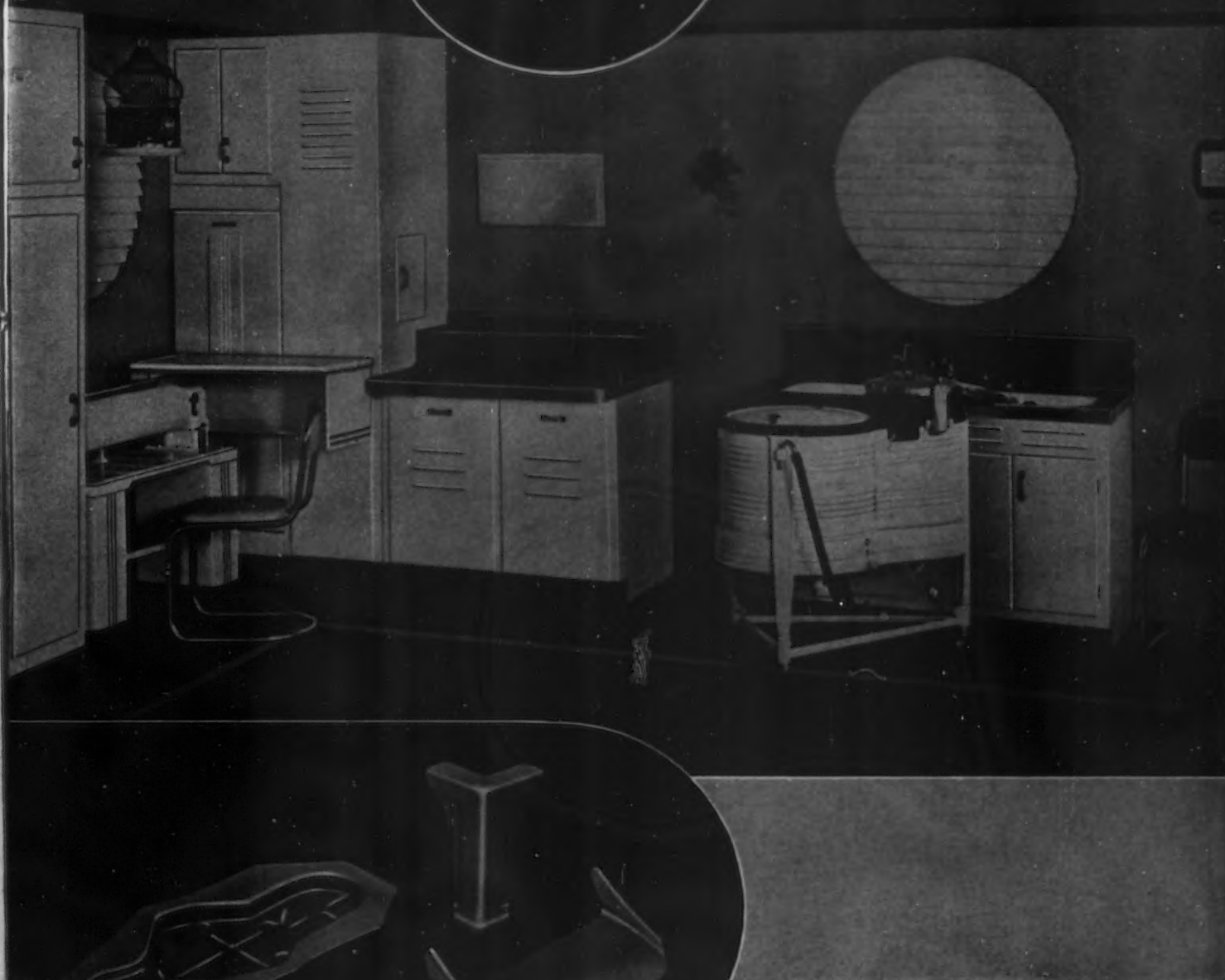
DISTRICT SALES OFFICES: *Boston*, 1001 Statler Office Bldg.; *Chicago*, 228 North LaSalle Street; *Cincinnati*, 2606 Carew Tower; *Cleveland*, 1217 Leader Bldg.; *Detroit*, 11-210 General Motors Bldg.; *New York*, 500 Fifth Avenue; *Philadelphia*, 1462 Broad St. Station Bldg.; *Pittsburgh*, 2800 Grant Bldg.; *Rochester*, 45 Exchange Street; *San Francisco*, Sharon Bldg.; *Toronto*, General Assurance Bldg., 357 Bay Street

UNIT OF

NATIONAL



Weirton Galvanized Sheets are helping the sheet metal industry develop the new field of air-conditioning.



These illustrations of washing machine parts again show the adaptability of Weirton Steel.

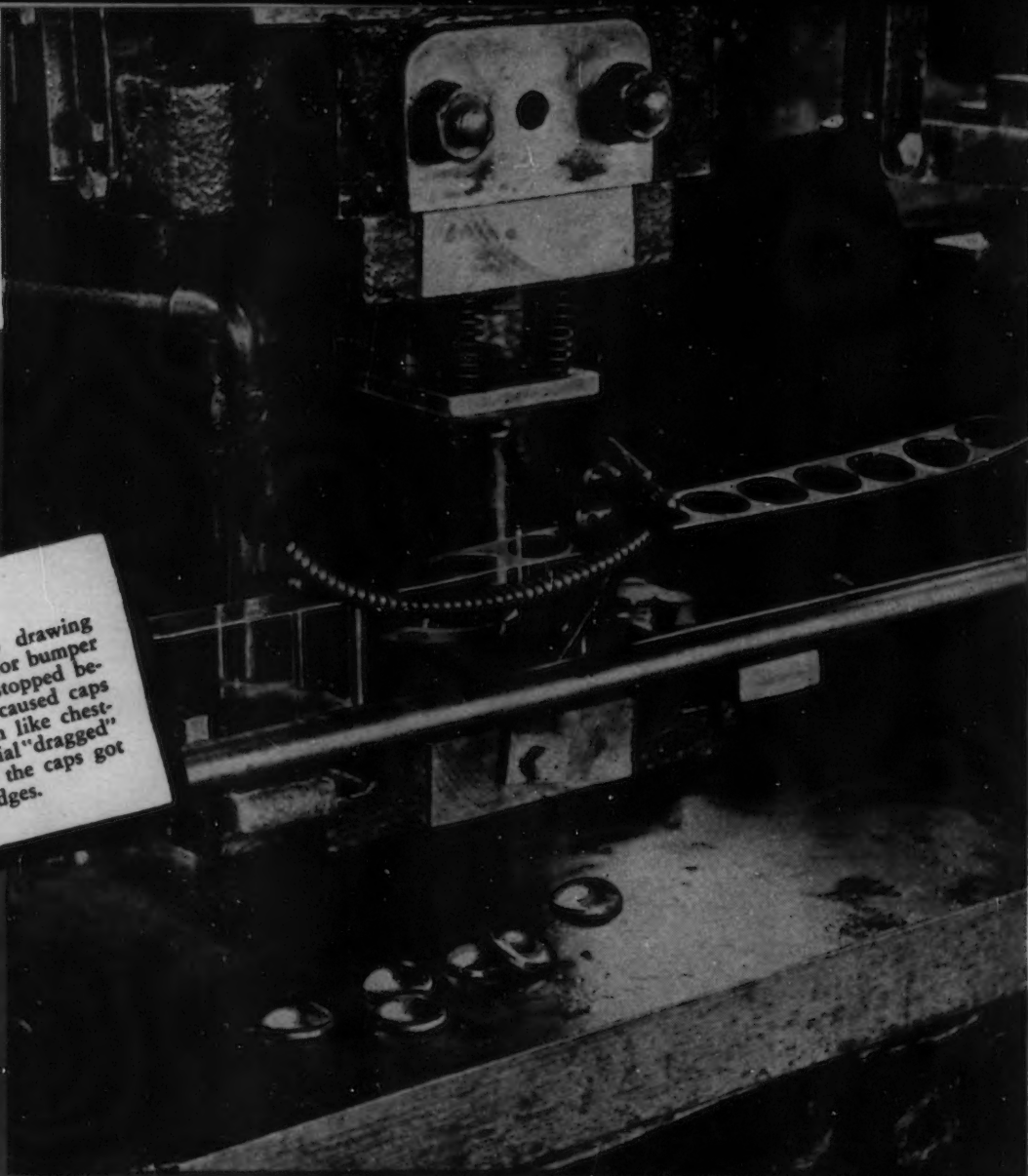
STEEL CORPORATION



THE IRON AGE, July 8, 1937—17

THE JOB

Punching and deep drawing Stainless Steel caps for bumper bolts. Production stopped because some steels caused caps to split wide open like chest-nuts—or the material "dragged" in the press and the caps got rough, ragged edges.



THE RESULT

Carpenter Stainless No. 6 solved the problem and ended the splitting of caps. Edges are smooth and the caps come out of the press with a fine, money-saving finish at a speed of 45 per minute. By choosing the right grade of Carpenter Stainless, you can often prevent production delays and get lower Stainless costs.

more than corrosion resistance



Carpenter

... "and then we tried CARPENTER STAINLESS!"

Surprising how many production men have told us lately about Stainless Steel jobs that had them completely stumped . . . "and then we tried Carpenter Stainless", they conclude.

There's something about the ring of satisfaction in a man's voice when he says it, that leaves no doubt about the result. Of course, we don't score a home run every time, but from what the men in the shop tell us, our batting average stays consistently high.

There are still some men who feel that all Stainless Steels are alike. Difficult jobs like the one shown, demonstrate that there *is* a difference—and that some Stainless Steels

are easier to fabricate than others.

You may have run into the sort of trouble that occurred on the punch and deep draw job pictured. It was solved by Carpenter Stainless No. 6. There is a grade of Carpenter Stainless Steel to meet every requirement—and Carpenter representatives are equipped by knowledge and experience to cooperate with you in overcoming trouble.

Would you like a copy of a book that will give you a lot of valuable information on fabricating Stainless Steel? Write for a copy of "Working Data and Technical Facts on Stainless Steels"—sent free in the U. S. A.

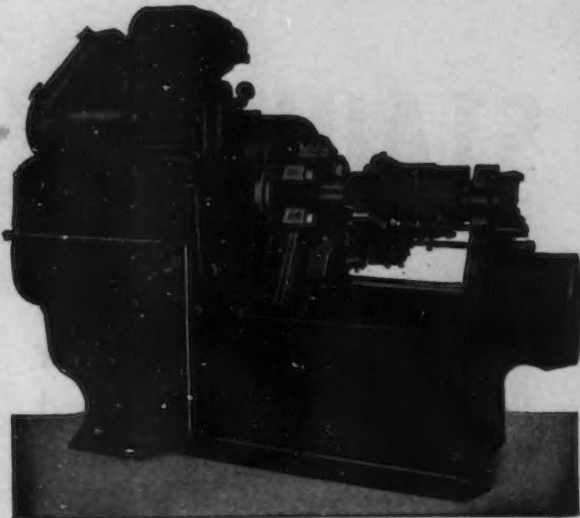


The Carpenter Steel Co.
READING, PENNA.

STAINLESS

STEELS

Accuracy Reduces Waste Of Time And Wear Of Equipment



BAIRD AUTOMATIC HORIZONTAL AND VERTICAL MULTIPLE SPINDLE CHUCKING MACHINES are built accurately to stay accurate. Automatic controls. Non-productive time less than 3 seconds on the 7" horizontal.

The BAIRD AUTOMATIC MULTIPLE SPINDLE INTERNAL INDEXING GRINDER HERE SHOWN not only automatically dresses and sizes the wheels but this automatic dressing and sizing is done for each wheel independently of the other wheels.

The wear of the roughing wheels of course is greater than the wear of the finer grinding or polishing wheels. In the BAIRD each wheel is dressed according to its need only so that renewal of grinding wheels is reduced to a minimum.

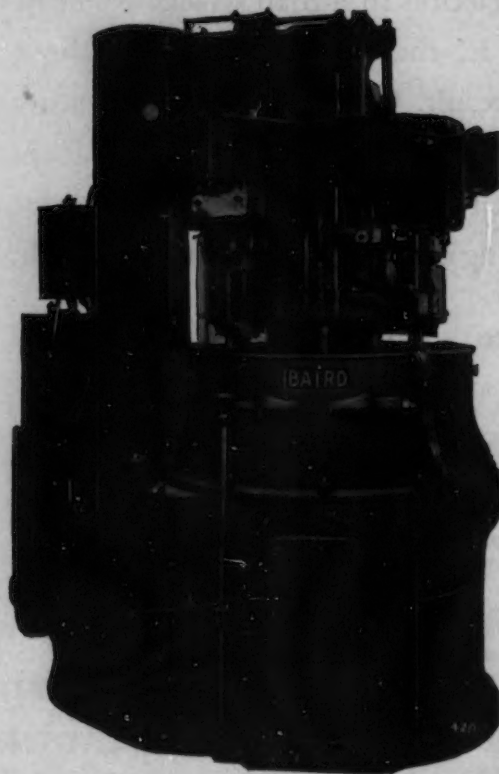
This effects savings in wheels as well as in the time lost for changing wheels in addition to the saving in the grinding operations for which the machine is designed.

These two machines illustrate the kind of savings effected by
BAIRD LABOR SAVING EQUIPMENT.

The degree of accuracy to which a machine is built limits its power of effecting savings as well as limiting its usefulness.

To this factor therefore, BAIRD engineers have paid particular attention and BAIRD machines are not only built to a fine degree of accuracy but provision is made to maintain it.

For instance, being able to produce work to close limits in the BAIRD AUTOMATIC MULTIPLE SPINDLE LATHES means that little has to be left for grinding thus reducing the time required for grinding and reducing the wear of the equipment.

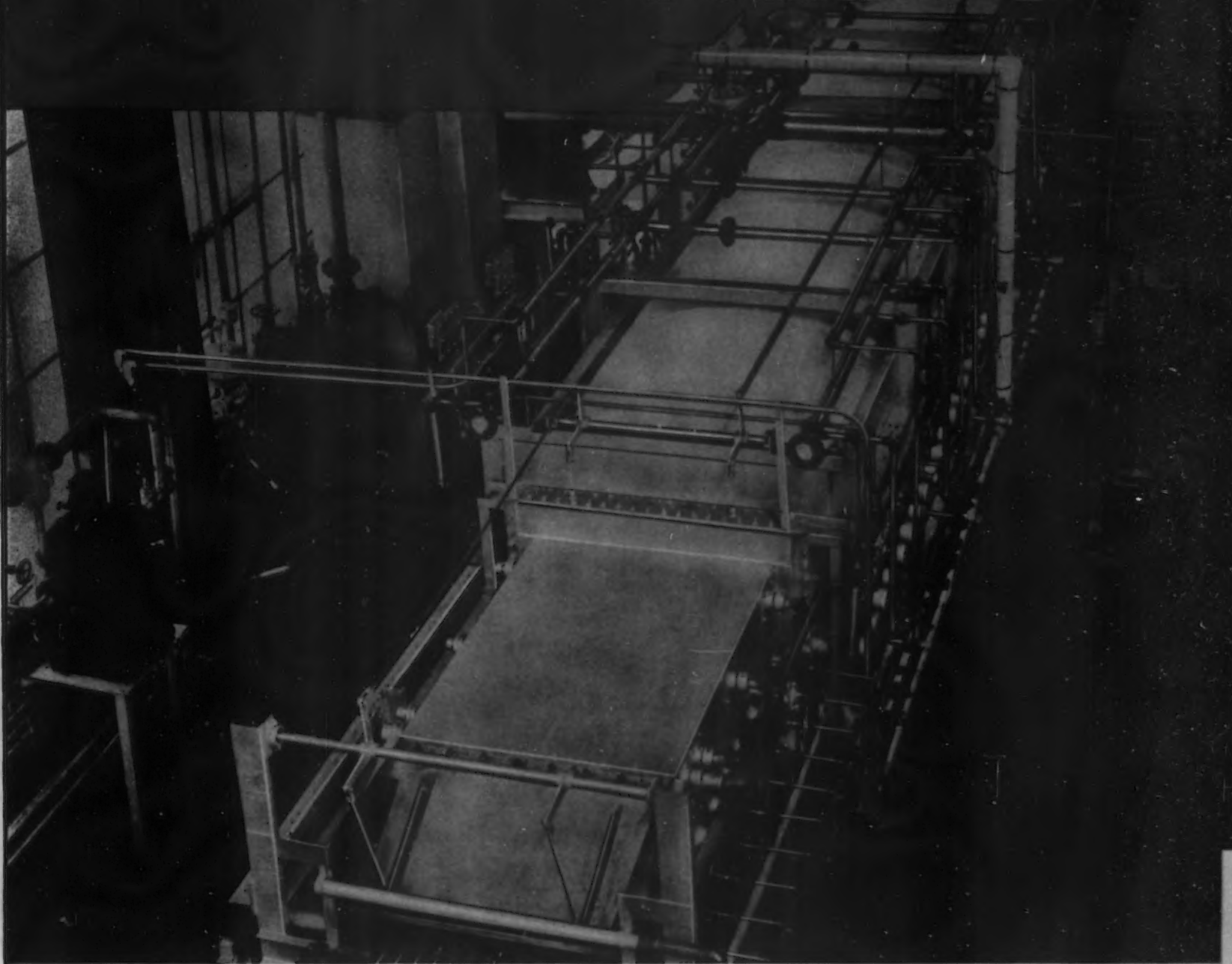


BAIRD AUTOMATIC MULTIPLE SPINDLE INTERNAL GRINDERS. Horizontal as well as Vertical. Built to a fine degree of accuracy.

"ASK BAIRD ABOUT IT"

THE BAIRD MACHINE COMPANY
BRIDGEPORT, CONN., U. S. A.

ELIMINATING PICKLING COSTS FOR 1 YEAR PAID FOR THIS!



● In many plants where normal pickling costs exist, this type of furnace will pay for itself the first year by the elimination of pickling costs in process and finish annealing treatments.

Of even greater importance is the fact that this furnace provides accurate control of quality and uniformity of the product. This in turn assures improvement in the drawing operation. All these factors have direct bearing in the reduction of over all production costs.

The furnace illustrated is used to bright anneal copper tubing in straight lengths and coils. Designed for process annealing at the rate of 6100 pounds per hour, this furnace is handling the entire production of the plant. Due to increased

production demands this furnace is being pushed to its limit and is successfully annealing as high as 9500 pounds per hour.

Bright annealing and the elimination of pickling in this direct-fired furnace is made possible by the use of an extraneous atmosphere in which the work is heated and cooled. By properly regulating a "cold-hot" cooling solution, bright

tubing is produced free from water stain and discoloration.

Surface Combustion engineers will design a furnace for your special requirements. Ask for the booklet "Wherever Heat is Used in Industry", it will give you an idea of SC engineering experience in building modern heat treating equipment.

SURFACE COMBUSTION CORPORATION, Toledo, Ohio

SURFACE COMBUSTION

Builders of ATMOSPHERE FURNACES and HARDENING, DRAWING, NORMALIZING, ANNEALING FURNACES for CONTINUOUS or BATCH OPERATIONS



Whitey Sez:

*"Spinning the globe in search of a spot
untouched by a MAURATH product is like
contacting the box-office for a 'first-nighter'
— the choice locations have all been sold."*

MAURATH, INC., CLEVELAND
BUILDER OF BETTER WELDING ELECTRODES IN ALL ANALYSES

NOT STEEL
BUT *STEELS*

Pouring hot metal into an Inland open hearth furnace

Today Inland's product is not *steel* but *steels*. For every heat that passes through the mill is checked to definite specifications. Elements are added; processes are altered. The customer finds that through Inland's well co-ordinated organization he is able to get better steel for his particular purpose. So much may be saved by securing a steel *exactly* suited to your particular needs—that we urge you to take advantage of Inland metallurgical cooperation.



SHEETS • STRIP • BARS
TIN PLATE • PLATES
STRUCTURALS
PILING • RAILS
AND ACCESSORIES

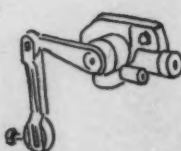
INLAND STEEL COMPANY

General Offices: 38 So. Dearborn St., Chicago, Illinois • Offices in: Detroit—Kansas City—Milwaukee—St. Louis—St. Paul

"Barnes-made" SPRING APPLICATIONS

Automotive Equipment

Air Brakes
Anti Rattlers
Auto Bodies
Brakes
Brake Bands
Brake Rods
Brake Shoes
Carburetors
Clutch
Curtains
Generators
Grease Cups
Head Lights
Hood Hooks
Horns
Ignitions
Mufflers
Odometers
Oil Cups
Shock Absorbers
Speedometers
Stabilators
Starters
Stop Lights
Tail Lights
Timers
Tire Connections
Transmissions
Valves
Windows



Aviation

Aeronautical Equipment
Antennae Reels
Brakes
Carburetors
Clutch
Fuel Pumps
Ignitions
Oleo Strut Shock Absorbers
Parachutes
Push Rods
Starting Equipment
Super Chargers
Tail Skids
Valves
Variable Speed Propellers



Diesel Equipment

as developed
and in
process of
development



Electrical Appliances

Brushes
Cords
Curling Irons
Curling Iron Holders
Electric Light Sockets
Electric Light Switches
Electric Light Switch Washers
Heaters
Irons
Motors
Pneumatic Tools
Pneumatic Tool Clips
Telephones
Toasters
Vacuum Cleaners
Vibrators
Washing Machines



Furniture

Cabinet Filers
Chairs
Desks
Display Cases
Filing Cabinets
Sawbenches
Toolboxes



Machinery, Miscellaneous

Bread Machinery
Can Opening Machines
Drills
Drill Presses
Floor Surfacing Machines
Knitting Machinery
Moving Picture Machines
Shoe Machinery

Miscellaneous

Berths
Bicycles
Bicycle Bells
Bicycle Brakes
Bicycle Pants Guards
Bracelets
Cameras
Cars
Car Windows
Cigarette Cases
Clocks
Door Checks
Elevators



Exercisers

Fare Registers
Fire Extinguishers (Small Parts)
Fire Extinguishers
Gas Cocks
Gas Engines
Gas Heater Washers
Gas Meters
Gong Bells
Governors
Guns
Hair Curlers
Headbands
Heat Regulators
Hinges
Implements
Journal Boxes
Levers
Locks
Meters
Motion Pictures
Precision Instruments
Sewing Shears
Pumps
Pump Valves
Punches
Sashes
Scales
Sewing Machines
Shade Rollers
Shears
Spray Guns
Steam Pumps
Stethoscopes
Surgical Instruments
Suspenders
Taximeters
Ticket Punches
Toys
Trolleys
Trolley Catchers
Trusses
Truss Attachments
Vibrators
Window
Window Screens
Window Screen Lifts
Window Shades
Wrenches
Wrench Washers



Musical Instruments

Automatic Pianos
Bellows
Cornets
Horns
Organs
Phonographs
Pianos
Player Pianos
Saxophones
Traps



Office Appliances

Adding Machines
Addressing Machines
Auto Calls
Cabinets and Files
Cash Registers
Check Protectors
Comptometers
Dictaphones
Drawing Instruments
Envelope Sealers
Loose Leaf Books
Mailing Machines
Numbering Machines
Stamp Affixers
Staplers
Time Clocks
Time Locks
Time Recorders
Typewriters



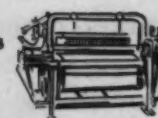
Radio

Battery Clip Parts
Binding Posts
Jacks
Plugs
Springs
Spring Washers
Stampings



Textile Machinery

Bobbin Rings
Card Repeaters
Dobbies
Head Motions
Looms
Lubrication
Picker Sticks
Reversing Mechanisms
Shuttles



THE WALLACE BARNES CO., Bristol, Connecticut

DIVISION OF ASSOCIATED SPRING CORPORATION

SPRINGMAKERS FOR MORE THAN THREE QUARTERS OF A CENTURY

COMPLETE HEAT TREATING EQUIPMENT OIL GAS ELECTRIC • ALL STANDARD FINISHES

SPECIAL DEPARTMENT FOR SMALL ORDERS • EXPERIMENTAL DESIGN CO-OPERATION

FRITZ J. FRANK
President

J. H. VAN DEVENTER
Editor

C. E. WRIGHT
Managing Editor

A. I. FINDLEY
Editor Emeritus

R. E. MILLER
Machinery Editor

F. J. WINTERS
Art Editor

T. W. LIPPERT
Metallurgical Editor

Associate Editors

F. J. OLIVER
N. E. MACMILLAN
F. JURASCHEK
Consulting Editor

G. RICCIARDI

Washington Editor
L. W. MOFFETT

Resident District Editors

T. C. CAMPBELL
Pittsburgh

ROBERT G. BINGHAM
Chicago

F. L. PRENTISS
Cleveland

W. F. SHERMAN
Detroit

Editorial Correspondents

F. B. RICE-OXLEY
London, England

ROBERT G. MCINTOSH
Cincinnati

G. FRAZAR
Boston

P. FIDRMUC
Hamburg, Germany

L. E. MEYER
Milwaukee

LOREN G. IRWIN
San Francisco

F. SANDERSON
Toronto, Ontario

ASA HOUNTREE, JR.
Birmingham

LEROY W. ALLISON
Newark, N. J.

ROY M. EDMONDS
St. Louis

F. T. TURNER
Buffalo



Owned and Published by



CHILTON COMPANY
(Incorporated)

Publication Offices
Chestnut and 56th Sts.,
Philadelphia, Pa.

Editorial and
Executive Offices
239 West 39th St.,
New York, N. Y.

OFFICERS AND DIRECTORS

C. A. MUSSELMAN, President

FRITZ J. FRANK, Executive Vice-President

FREDERIC C. STEVENS, Vice-President

JOSEPH S. HILDRETH, "

GEORGE H. GRIFFITHS, "

EVERIT B. TERHUNE, "

ERNEST C. HASTINGS, "

WILLIAM A. BARBER, Treasurer

JOHN BLAIR MOFFETT, Secretary

JOHN H. VAN DEVENTER

JULIAN CHASE

THOMAS L. KANE

CHARLES S. BAUR

G. CARROLL BUZBY

P. M. FAHRENDORF



C. S. BAUR, General Advertising Manager

A. H. DIX, Manager Reader Service

Member, Audit Bureau of Circulations
Member, Associated Business Papers
Indexed in the Industrial Arts Index.
Published every Thursday. Subscription
Price: United States and Possessions,
Mexico, Cuba, \$6.00; Canada, \$8.50;
Foreign, \$12.00 a year. Single copy,
25 cents. Cable Address, "Ironage, N. Y."

ADVERTISING STAFF

Emerson Findley, 621 Union Bldg., Cleveland

B. L. Herman, Chilton Bldg., Chestnut & 56th
Sts., Philadelphia, Pa.

H. K. Hottenstein, 802 Otis Bldg., Chicago

H. E. Leonard, 239 W. 39th St., New York

Peirce Lewis, 7316 Woodward Ave., Detroit

C. H. Ober, 239 W. 39th St., New York

W. B. Robinson, 428 Park Bldg., Pittsburgh

D. C. Warren, P. O. Box 81, Hartford, Conn.

THE IRON AGE

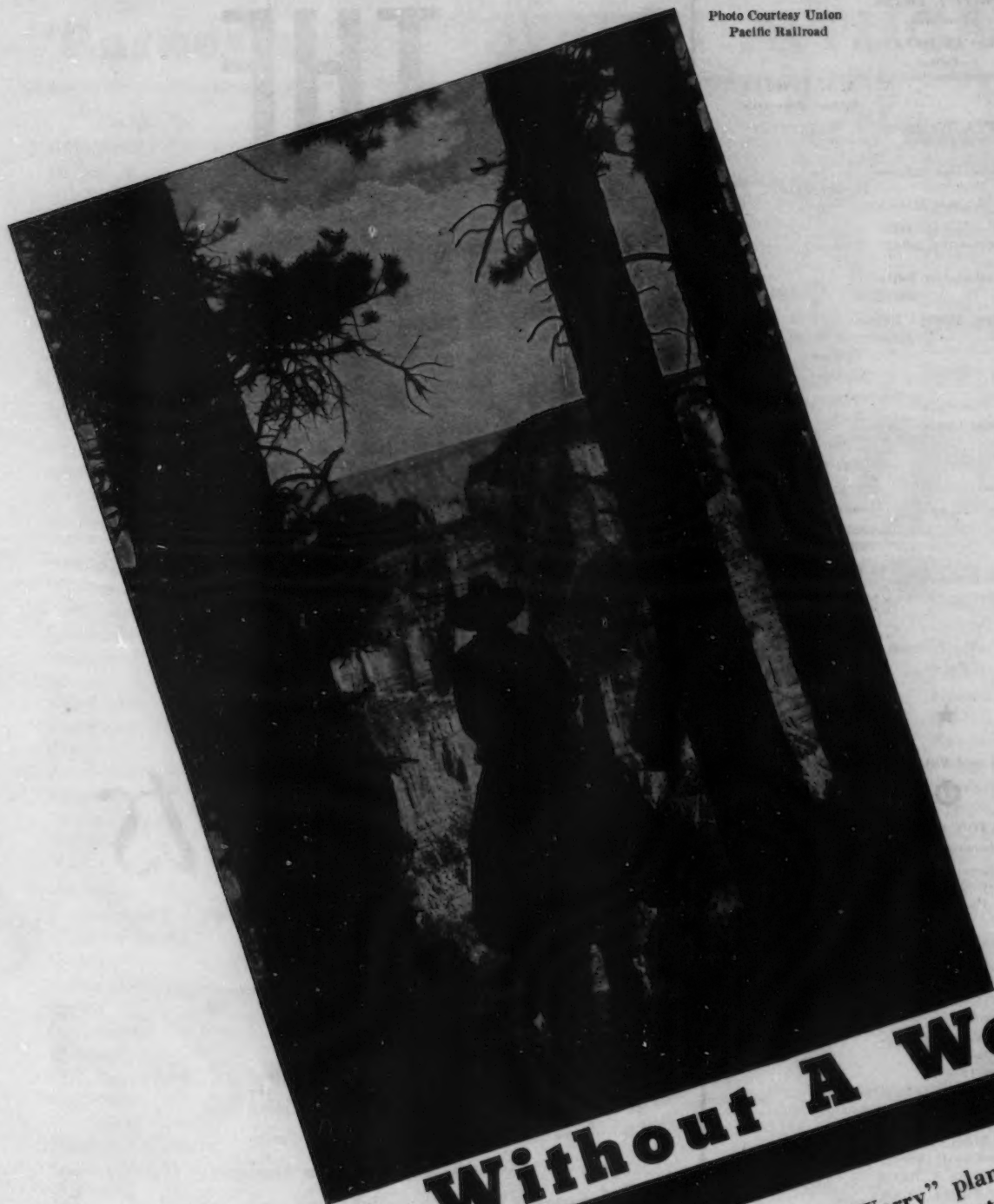
Contents

JULY 8, 1937

Fear Psychology	27
Successful Profit Sharing Retirement Plan	28
Machine Tapers Standardized	32
Informality an Asset in Production Control	35
Portland Cement Binder for Foundry Sand	37
Machine Housing Welded to Close Limits	38
Conveyors Motivate Continuous Flow Principle	42
Timken Expands Research Facilities	46
Society for Testing Materials Meets	48
Prize Bridges	51
Statistics on Metal Working Activity	52
Rate of Activity in Capital Goods	53
Automotive Industry	54
Washington News	58
NEWS CONTENTS	72
Plant Expansion and Equipment Buying	128
▼ ▼ ▼	
New Industrial Literature	129
Just Between Us Two	155
Products Advertised	156
Index to Advertisers	182

Copyright 1937 by Chilton Company (Inc.)

Photo Courtesy Union
Pacific Railroad



Vacation Without A Worry

● Try the Ryerson "Vacation Without a Worry" plan that eliminates all thought of delayed, slow or uncertain steel deliveries—and make yours a real vacation... We have thousands of tons of steel in stock and for almost a century we have been demonstrating our ability to quickly and accurately deliver steel as needed... Let us shoulder your steel worries... Simply tell your assistant to "Call Ryerson when steel is needed." Emergency as well as regular requirements will be taken care of promptly. Joseph T. Ryerson & Son, Inc. Plants at Chicago, Milwaukee, St. Louis, Cincinnati, Detroit, Cleveland, Buffalo, Boston, Philadelphia, Jersey City.

RYERSON

THE IRON AGE

JULY 8, 1937

ESTABLISHED 1855

Vol. 140, No. 2

Fear Psychology

PRESIDENT ROOSEVELT hit the nail squarely on the head when he told us, during the depth of depression that "fear is the thing we have to fear." However, that statement could be qualified, to advantage, with respect to the causes of fear.

Fear makes the superstitious dorky take a two mile detour home after sundown rather than take the direct one mile route past the graveyard. And fear makes the father and mother hurry to call the doctor when their child has a serious fever.

In the one case fear is unwise and unnecessary because its cause is an imaginary one. In the other case, fear is a part of wisdom and the lack of it would stamp one as foolish.

Fear was at work among us during the depression and it is at work among us today. But not the same kind of fear. During the depression we feared the unknown. Today we know what we fear. Imaginary fears can be removed by fireside radio talks, but fears based on real causes require more than words.

Fear is at work today and it is hurting business just as badly as the fear of the unknown and the imaginary hurt us during the darkest days of the depression. Perhaps more so. It is not fear of a workers' government that is bothering the employer and the great majority of independent labor today. It is fear of a dictatorship by non-workers who are out to "work" the workers.

It is not so much the loss of wages and of profits in plants closed by strikes that is hurting business today as it is the intersecting and extending concentric circles of fear which spread out from them. It is affecting the employer who has been planning plant extensions or improvements that would normally increase the number of people employed and which have now been postponed until he can tell whether mob rule or law and order are going to run this country.

But more serious than this has been the effect upon the hundreds of thousands of workers in plants not yet visited by the Lewis strong arm gang. In expectation of his coming and in view of what it has meant elsewhere in time and wages lost, intelligent labor has put a rubber band on its pocket book. It is curtailing expenditures to the limit in preparation for troublesome times ahead.

Today, industry is living primarily on its backlogs. New business has been steadily decreasing in most lines for the past three or four weeks. Troublesome times are ahead for all of us and less employment for labor unless Washington recovers its traditional American intestinal fortitude.

J. H. Van Derveer

A Profit-Sharing Retirement Fund



CONSOLIDATE profit sharing with permanent saving for retirement security. This is a practical formula which fits America's present day industrial and social problems. It is one which has been in actual use for over 18 years. It is a plan which effectively meets the stipulations set forth as the result of an extensive research undertaking whereby workers were contacted in more than 300 representative industrial plants in 32 states.

What is the sentiment of American workers? Research discloses that 80 per cent of workers oppose strikes. Wages and hours are definitely not paramount in the employee's thought or grievances. Only 62 per cent mention the former and but 34 per cent the latter. Predominant, however, is the desire and demand for profit-sharing or participation in earnings.

Most workers express the belief that the basic values of life, liberty and happiness can be better maintained by an economy of private enterprise, but express strong resentment at being classed as a commodity. Statements that workers are rising en masse and demanding unionization are wholly unfounded. Workers are herded into unions because the employer does little, if anything, to counteract the claims, promises and arguments of organizers. They join unions when union leaders make demonstrations of power which awe and impress them or by threat and pressure make it uncomfortable for them to hold out against unionization. Good personnel policies have been nullified and counteracted by arrogant, tem-

peramental minor-rank supervisors and foremen who offend employees through arbitrary orders, fits of tempers, officiousness, favoritism and other offensive tactics.

Four Conclusions

From the array of evidence submitted there can be drawn four conclusions for careful consideration by employers:

1. *Union organizers have little influence and play unimportant roles unless the workers are prejudiced against the concerns that employ them.*

2. *Employee morale and resistance to outside influence is weakened principally by the futility of the future, fear of old age with its danger of dismissal and its threat of poverty.*

3. *As true as "old friends are best," so old employees of long service are a real defensive asset for they have 'held the line' against outbreaks and strikes in many plants. There should be a premium on long service rather than a penalty.*

4. *Corporations should give em-*

phasis and devote headlines to wages paid, rather than to profits in their publicity of annual reports.

Are pensions the answer to the problem? Corporation preference for types of pension plans is fairly well indicated by the results of a research conducted by the National Industrial Conference Board. About 2450 companies of varied size and diversified industry reported personnel activities. Of this number, 897, or 36.6 per cent, employing 3,168,882, reported having pension plans, of which 253, or 10.3 per cent, employing 1,996,052, were using the "formal" or "contributory" type plan and 580, or 23.7 per cent, employing 1,071,683, were operating the "informal" or "non-contributory" plan, and 64, or 2.6 per cent, employing 101,147, were using a varied form not reported. The "contributory" plan is more generally used by the larger employers of labor.

Plans are so varied, conditions to which they apply are so diversified and the purpose for which they are intended are so often coordinated



Plan That Has

By M. J. EVANS
Evans Associates, Chicago

Worked Successfully ▲ ▲ ▲

to other personnel practices that to condemn this or that plan would be folly. In fact, there exist situations where the poorest plan is working with complete satisfaction and harmony, but in such cases it is not the plan which gets the results but the personal relationship established and maintained between employer and employee.

Pensions Regarded As Charity

Too many employees regard a pension as charity—and how else can they view the non-contributory pension plan? It is generally granted and announced with a patronizing gesture. Furthermore, that type of pension, not bound and sealed with contractual relations nor participated in by the employee with his own contributions, is too uncertain.

Pension plans do not in themselves furnish the allure or the challenge upon the imagination of the employee as being a sufficient reward for a life-time of labor. The pension lacks glamor—it isn't the pot of gold at the end of the rainbow. As a "gratuity" it fails of

appreciation and is accepted more in a "better than nothin'" spirit. As a "deferred wage" the undercurrent reaction is "put it in the pay check now."

These facts lead to the observation that the pension plan in itself is insufficient as a formula to eliminate labor trouble in this day. However, unless better provision for financial protection of the employee can be evolved, no one would want to see pension plans abandoned.

Admitting the superior advantages of annuities, it is the belief that because of the dilution of personal relationship between employer and employee and the consequent transfer of dependence by the employee from the employer to the insurance company, coupled with the inadequacy of annuity payments after retirement, even the annuity plan will not suffice to hold the line in the face of present trends, demands and philosophies of labor as a mass group.

Welfare programs call forth the highest commendation. These activities, within reasonable bounds,

are necessary and under any general employee-relations program must be carried on to certain limits. Any phase of personnel work which helps to create a more friendly feeling between management and employee cannot help but be of value to the organization. But welfare programs cannot hold the line in crises.

Wage Incentives No Panacea

Thoughtful employers no longer consider wage incentive plans as in any degree a panacea for labor ills. Such plans fail to satisfy the worker of today whose eyes are cast far into the future and whose worry is not wage but age.

Last year saw industrial employees enjoy the biggest bonuses ever known. But the sum and substance of it was that industry received very little credit for the gesture, for the politicians took their share by telling the workers that their surplus tax law forced the money out, and the labor leaders told them that their demands compelled the payments and that "you should have had it before, it is only what you have been entitled to, and we propose it shall keep on coming to you."

Expressions of employees far and wide indicate that with this rain of checks accompanying the daily press ballyhoo of record earnings, huge profits and extra dividends, the employees feel that they only had a share of what they were entitled to and that with this "taste of blood" there will be constantly recurring demands for more. The results to industry were nil.

Profit sharing is generally of two types: the "limited" plan restrict-



ing participation to a small group, usually executives and certain long service employees; and the "unlimited" plan which admits to eligibility practically all employees with some qualifications such as length of service. A third type which might be termed the "unlimited contributory" plan has appeared after a long period of test and experience which presents most unusual features of stability, soundness and general satisfaction. The prevailing weakness in programs for the financial benefit of employees is the almost universal absence of provision for conserving or enforcing accumulation of funds granted or paid to workers as rewards, bonuses or sharing of earnings.

The practical formula for the solution of labor troubles must provide for enforced accumulation which in turn will provide permanent and substantial social security. Industry must learn to personalize and humanize itself in the eyes of the public. Do that first in the eyes of your employees, the rest will not be difficult.

The foregoing leads to a practical employee-relations formula which is simple, has been proved efficient, is the weapon by which industry can defeat collectivism and socialism; and, it accomplishes the objectives of many policies in one plan.

A Profit-Sharing Retirement Fund

Contributions: By employees to the amount of 5 per cent of their wages or salary, not exceeding \$200 per year, and payments by the corporation of not less than 10 per cent of its net earnings, but with the proviso that in no case shall the corporation contribution exceed four times the amount paid in by employees.

Service: Two or three years (optional) required for membership and participation, and compulsory after such period of service.

Retirement Age: Sixty years or when permitted by disability.

Fund Investment: That portion of fund contributed by employees must be subject to state law regulating investment of trust funds; portion contributed by corporation invested at the discretion of trustee and advisory board.

Control of Fund: By trustee (executive officer of corporation) and

advisory board consisting of the trustee and four other members, two elected by the employees and two selected by the corporation.



Dismissal of Employees: An employee, a member of the fund, if dismissed from service, shall have the right of appeal to the advisory board, a four-fifths vote of which is required to sustain the dismissal.

Dismissal or Voluntary Withdrawal Credit: If an employee voluntarily withdraws or is discharged from service, he should be paid every dollar he has paid in, plus accumulated interest of record, together with 40, 50 or 60 per cent (optional) of the corporation contribution, credited to his account, plus accumulated interest of record; remainder of the corporation credit to revert to the fund for credit to remaining members.

Integrity of Fund: Provision must be made to maintain the fund independent of the solvency or permanence of the corporation and unassailable from attack by creditors of either the corporation or of the employee. Assignment of interest must be made impossible.

Payments or Credits: Must be credited regularly and published regularly to the membership, and above all, must be maintained in the truest sense as an extra reward.

Life Insurance: Covering first six or seven years of membership in the profit sharing fund, the death payment decreasing each year in inverse ratio to the increased credits in the fund. This is to insure reasonable security and protection to the worker during the early period of his accumulations. Premiums deducted from corporation contribution.

Health and Accident Insurance: To provide protection against sickness, hospital expense, medical care. A provision highly appreciated and of moderate cost to the corporation.

Fills the one gap of fear and insecurity in event of incapacity to work. If nothing prevents the employee from working, the profit-sharing fund removes all other fears and worries.

Administration and Human Relations Program: The success of any financial or employee-relations program is dependent upon the personal element in its administration. No matter how sound and beneficial a plan may be in its mechanical structure, its engineering must be in the care of those who are (1) humanly sympathetic to its objectives, (2) conscientious to its responsibilities, and (3) empowered with responsibility and equipped with ability for the investment and protection of funds, consultation with employees and a friendly advisory service. It is better that no plan or program be installed, if the "human engineering" care or administration is omitted or not given first consideration.

Plan Easily Understood

The above plan is simple and easily understood by the worker who is able to calculate with reasonable accuracy the steady development in his behalf.

Young, unattached men and women, with a long future, with minor responsibilities and commitments, require an extraordinarily positive stimuli; that is, the challenge of a big reward at the end of the working age, an appeal to the imagination of the career-building motive. Under the above plan the older employee becomes the tutor of the young to the importance of the future.

A "fortune at sixty" is the key idea in the mind of the employee. A \$25 per week worker, after 30 years employment, would at the age of 60, receive approximately \$30,000 based on the experience of the company which originated the plan. If he died in his 59th year his family would get this entire sum. If he lived past 60 he has the option of leaving his accumulation with the company at six per cent, receive \$150 per month the remainder of his life, his family or estate receiving the \$30,000 in event of his death.

The employee-member has no fear of unjust discharge. Should he be discharged, he has the right of appeal to the advisory committee and if the discharge is not sustained by a four-fifths vote, the

member must be reinstated, and it must be remembered that two of the five are fellow workers.

The employee is saved from his own weaknesses, of dissipating his savings, which accumulate with increasing volume under the stimulus of compound interest plus credits resulting from discharged or withdrawing members.

Although the purpose is to keep the fund inviolate and intact, the advisory committee has discretionary power, with the consent of the trustee, to make loans to employees under extenuating circumstances and emergencies. Herein lie the opportunities for efficient human engineering.

The company which originated the above plan has conducted this "Profit - Sharing - Savings - Retirement" policy for over 18 years, and has never had labor trouble. This company finds that the plan has the following advantages — Promotes individual employee efficiency by stimulating hope and ambition. Develops general efficiency of all employees by sustaining group interest and responsibility. Prevents labor unrest and conflict. Reduces labor turnover, by attractive reward for continued, faithful service. Prevents waste and losses usually due to carelessness and discontent. Promotes effective management. Creates and builds a market for company securities, and, provides humanitarian benefits and old-age security. In effect, this plan encompasses a pension system, a savings plan, a retirement fund, incentive wage plans, a bonus system, an annuity plan, and possibly a merit system. It creates capitalists from the workers, completely changing their thinking and attitude toward the industrial system. It makes workers a part of the profit system and by their participation transforms their sentiment from one of antagonism to that of acceptance and defense. It constitutes a genuine recognition of labor as a partner in the industrial partnership. It supplies that factor missing in practically all other plans—that cohesive element that impels the employee to stick.

Plan Can Be Adapted to Any Company

The corporation pioneering this profit sharing plan, produces products having no patent protection and operated in a national field of

wide-open competition, without special privileges or trade advantages of any kind. Companies paying the going or prevailing wage scales of



their industry or their community will, if using this plan, experience no bickering or bargaining for increased wages for the reason that the employee is fully aware that

his wages are at par with standard rates besides being deeply conscious of enjoying a participation in profits far outweighing and subordinating the customary issue of wage increases.

Any business, manufacturing or industrial institution having a record of successful operation and sustained earnings would appear to be qualified to adopt the plan with definite value to itself and great benefit to its employee group. Either an established record of earnings or some special financial arrangements should be the basis for fortifying the employees against collapse and disappointment. This plan is wholly independent of union labor connections or attitudes, it being a neutral program having no relation or effect upon open or closed shop policies.

Measures Nickel Coatings by Magnet

THE local thickness of an electroplated nickel coating on a non-magnetic base metal may be measured by the force of attraction of a small permanent magnet, the attractive force being determined with a simple spring balance, according to Abner Brenner, of the National Bureau of Standards, who discusses the entire subject in detail in a paper numbered RP994.

In this paper, it is pointed out that the attractions of a small permanent magnet for nickel coatings on nonmagnetic base metals are proportional to their thicknesses, up to about 0.025 mm. (0.001 in.). The magnetic method can be quickly applied to nickel coatings deposited on nonferrous metals under fairly uniform conditions, provided that the instrument has been calibrated against similar nickel coatings of known thickness.

If nickel coatings of unknown history have been annealed at 400 deg. C. (750 deg. F.), their thickness may be measured magnetically, provided a constant for annealed coatings is used. Each per cent of iron in a nickel deposit introduces an error of about + 4 per cent in the thickness measurements, and each per cent of cobalt an error of about + 2 per cent.

On plane surfaces the magnetic measurement yields correct results if the diameter of the area tested is at least five times the diameter of the magnet. Measurements closer to an edge or corner than about twice the diameter of the magnet are inaccurate unless the magnet has been especially calibrated for such positions. On curved surfaces the results are practically the same as on planes, provided the radius of curvature of a sphere is at least five times the diameter of the magnet and the radius of a cylinder twice the diameter of the magnet. The measurements on sheet metal are affected by the presence of a nickel coating on the other side unless the thickness of the base metal is at least three times the diameter of the magnet. It is possible to compute the approximate thickness on each side of a thin sheet from magnetic measurements made on both sides.

The presence of the usual thin decorative chromium coatings over the nickel has no appreciable effect on the thickness measurements, and is advantageous because it prevents oxidation of the nickel during annealing. The magnetic method is rapid and nondestructive, and for thin coatings its accuracy approaches that of metallographic measurements.

Machine Tapers Standardized

American Standard, recently approved, reduces to 19 the former 60 to 100 or more individual self-holding tapers covered by six different systems

By FREDERICK S. BLACKALL, Jr.*

WITH its recent approval by the American Standards Association, a new and simplified series of self-holding or "slow" tapers becomes available to American industry. This should ultimately make possible a high degree of interchangeability of machine fittings, accessories and tools, thus widening the field which the manufacturer of taper shank tools can cover with a basic minimum stock, and reduce the inventories which the tool user will have to carry in his tool cribs.

The new self-holding taper series embraces 19 different tapers, ranging in size from 0.239 in. to 12 in. when measured at the large diameter or gage line. This series is designed to serve every purpose now covered perhaps by half a dozen different systems which include 60 to 100 or more individual tapers.

Characteristics of New Standard

Basically, the new taper series represents the adoption or adapta-

tion of the best features of a number of the more widely used taper series already in existence. The new American Standard taper incorporates the following characteristics:

(a) Brown & Sharpe tapers Nos. 1, 2 and 3, each with a taper of $\frac{1}{2}$ in. per foot but re-numbered according to the decimal diameter at the gage line, respectively, 0.239 in., 0.299 in. and 0.375 in.

(b) Morse tapers Nos. 1, 2, 3, 4 and 5, with the taper per foot, as now correctly computed, rounded to three decimal places. These tapers will bear the original Morse numbers.

(c) A new taper between No. 4 and No. 5, designated as the No. 4½, based on a slope of 0.623 in. per foot, with a diameter of 1.500 in. at the gage line. This taper has the same slope as the Morse No. 4.

(d) An entirely new series of tapers of large size, each with a slope of $\frac{3}{4}$ in. to the foot, each designated by the number of tenths of an inch in the diameter at the gage line and ranging in size of the gage line diameter from 2 in. to 12 in.

The accompanying table sets

forth the essential dimensions of the American Standard taper series and the origin of its three major divisions.

Taper Fitting an Old Art

Use of the taper fit for joining machine parts, or as a tool-holding or work-holding device, is a very old art. Probably the first step in an attempt to standardize taper dimensions was taken, however, by the Brown & Sharpe Mfg. Co. in 1860, when the well-known Brown & Sharpe series of taper standards was proposed. These tapers had a slope of $\frac{1}{2}$ in. per foot, measured on the diameter, and covered a range from 0.2391 in. to well over 3 in. Shortly afterward, in 1862, the Morse Twist Drill & Machine Co. developed a series of eight tapers, each with a slope of approximately $\frac{3}{4}$ in. to the foot.

The use of these two systems promptly became international, and the Morse series in particular had become so widely adopted by the time engineering standardization was launched as a national or international activity that it appears to have become part and parcel of every international standard developed either here or abroad.

Unfortunately, however, at the time the Morse taper was original-

*Mr. Blackall is president of the Taft-Peirce Mfg. Co., Woonsocket, R. I., and chairman, Technical Committee 3 of the Sectional Committee on Small Tools and Machine Tool Elements. His article herewith is from the June issue of *Industrial Standardization and Commercial Standards Monthly*, published by the American Standards Association.

ly proposed the accuracy attainable in manufacturing and measuring was so limited in the light of present-day practice that substantial errors were introduced in the taper per foot from the basic $\frac{3}{8}$ -in. standard. These errors have been perpetuated to this day, and undoubtedly account for the inconsistency which appears in the taper per foot among the eight tapers in the Morse series, as well as the variation which exists among the several Morse tables extant.

Committee Opinion Divided

When the proposal to develop an American standard for a self-holding taper series was first undertaken in 1926, it soon became apparent that the members of Technical Committee No. 3, on machine tapers, were divided into two groups. The idealists held that the errors in the existing taper series should be corrected once and for all or eliminated altogether by the adoption of a new, uniform and consistent taper series. The other group believed that among existing standards, the Morse series in particular had become a *de facto* standard, which, however imperfect it might be, had to be recognized as the international standard.

It is reasonable to assume that

this divergence of thought within the committee was typical of the views held in industry itself, since the membership of this committee and of its sponsor bodies was broadly representative of American industry, engineers, manufacturers of tools, and consumers. All were united in the belief that simplification—that is, a reduction in the number of existing standards—should be brought about; but the detailed application of the simplification procedure presented a difficult problem.

New Standard a Compromise

It is not surprising, then, that the standard as finally adopted represents a compromise. Indeed, there was good reason for a compromise. The adoption of a radically different standard from those already in use for drills and reamers, would, for example, if it were to be effective, would at once make obsolete machine-tool spindles throughout the world. More probably, the new and different standard would degenerate into a futile and theoretical gesture. And so the committee was undoubtedly wise in resisting the temptation to develop a new taper of its own choosing, in lieu of the well-established Morse series of tapers, Nos.

1 to 5, inclusive. The inclusion of the new American standard No. $4\frac{1}{2}$ taper is a recognition of the well-known gap which exists in this part of the Morse series, and it appears to be sound procedure to base the new $4\frac{1}{2}$ taper on the Morse system as well, since it becomes substantially an integral part of it.

Adoption of the Brown & Sharpe 1, 2 and 3 tapers is a recognition of the better sticking or holding qualities of the $\frac{1}{2}$ -in. taper in small sizes and, incidentally, eliminates the need of the Morse No. 0 taper, which has been dropped.

In the field of large tapers, from 2 to 12 in. inclusive, the committee had a better opportunity for original work. It did, however, borrow from the Sellers taper the $\frac{3}{4}$ -in. slope, which had been employed in the Sellers series since 1862 although in a substantially smaller size range.

Jarno Series Eliminated

The committee gave thoughtful consideration to the Jarno taper series of six-tenths of an inch per foot, originally developed by O. J. Beale, Brown & Sharpe Mfg. Co., in 1889. As the Jarno was largely a duplication, as far as size range was concerned, of the Morse series,

American Standard Self-holding Tapers—Basic, and Certain Calculated Dimensions

No. of Taper	Taper ¹ per Foot	Diam- eter ¹ at Gage Line	Diam- eter ² at Small End	Length ² Gage Line to Small End	Means of Driving and Holding			Origin of Series	
A	B	C	D	E					
.239	0.500	0.239	0.200	$\frac{5}{8}$	Tongue Drive with Shank Held in by Friction	Tongue Drive with Shank Held in by Key	Key Drive with Shank Held in by Key	Key Drive with Shank Held in by Draw- Bolt	Brown and Sharpe Taper Series
.299	0.500	0.299	0.250	$1\frac{1}{8}$					Morse Taper Series
.375	0.500	0.375	0.312	$1\frac{1}{2}$					Rounded to three Decimal Places
1	0.600	0.475	0.369	$2\frac{1}{8}$					
2	0.600	0.700	0.571	$2\frac{3}{8}$					
3	0.602	0.938	0.778	$3\frac{1}{8}$					
4	0.623	1.231	1.020	$4\frac{1}{8}$					
4½	0.623	1.500	1.266	$4\frac{1}{2}$					
5	0.630	1.748	1.476	$5\frac{1}{8}$					
200	0.750	2.000	1.703	$4\frac{3}{4}$					
250	0.750	2.500	2.156	$5\frac{1}{2}$					
300	0.750	3.000	2.609	$6\frac{1}{4}$					
350	0.750	3.500	3.063	7					
400	0.750	4.000	3.516	$7\frac{3}{4}$					
500	0.750	5.000	4.422	$9\frac{1}{4}$					
600	0.750	6.000	5.328	$10\frac{3}{4}$					
800	0.750	8.000	7.141	$13\frac{3}{4}$					
1000	0.750	10.000	8.953	$16\frac{3}{4}$					
1200	0.750	12.000	10.766	$19\frac{3}{4}$					

All dimensions are given in inches.

¹ Taper per foot and diameter at gage line (columns B and C) are basic dimensions.

² Dimensions in column D are calculated to three decimal places from the basic dimensions and are for reference only.

however, and as the latter was unquestionably in wider use, the elimination of the Jarno from final consideration seemed to be sound. This is a departure from the practice followed by the German and Swedish standardizing bodies in adopting a national standard composed of tapers chosen from the 0.6 and $\frac{1}{8}$ -in. series, the first of which is designated as the metric series, while the second is substantially the Morse taper.

Advantages of New Standard Taper

Some specific advantages may be expected to accrue to industry from the widespread adoption of the new American Standard taper. The potential reduction in inventories of arbors, centers, drills, reamers, collets, and every other small tool item which depends on a taper fit for its use in machine-tool applications is tremendous. Stocks both on manufacturers' shelves and in the tool cribs of consumers can be cut down enormously.

Furthermore, publication of detail dimensions of the taper standard, developed by the National Machine Tool Builders' Association, the Society of Automotive Engineers, and the American Society of Mechanical Engineers as joint

sponsors under the procedure of the A.S.A. will eliminate once and for all the eternal question as to just what constitutes the standard. For years, minor but frequently important variations have occurred between tables published by the various companies and agencies purporting to describe existing tapers, such as the Morse.

Supported by Sound Gaging Technique

It is reasonable to suppose, also, that the new standard will prove more useful than any of the old standards alone or any combination of them, because it represents the cooperative effort of American industry and may therefore be supposed to be tailor-made to meet its needs. It is unquestionably broader in scope than any existing taper series and is far simpler than any other combination of them. The detail dimensions, both for taper shanks and for the corresponding dimensions of taper sockets, have been developed to meet every condition under which these tapers will be used. These include the tongue drive with the shank retained by friction, the tongue drive with the shank retained by a key, the key drive with the shank retained by

a key, and the key drive with the shank retained by a draw bolt.

Finally, the standard is supported by sound gaging technique which has been worked out in conjunction with it and has been published as a part of the standard. Thus users are given not only correct dimensions to follow but also sound means of maintaining them. Indeed, even the nomenclature of tapers has been standardized in order to avoid any confusion or misunderstanding as to the character of the standard.

Technical committee No. 3 is now at work on the development of a self-releasing or steep taper series as a complement to the self-holding taper, probably (although this is not yet assured) with a slope of $3\frac{1}{2}$ in. per foot.

The new American Standard for Machine Tapers, Self-Holding Taper Series (B5.10-1937) is published in the form of a 12-page booklet containing five tables of taper dimensions, two tables of plug and ring gage dimensions, and a glossary of nomenclature. Copies are available through the American Standards Association, 29 West Thirty-ninth Street, New York, or through the sponsor organizations at 50 cents each.

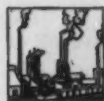


THIS diorama is the central feature of the National Machine Tool Builders Association exhibit at Cleveland's 1937 Great Lakes Exposition. It is one of a series of three designed to graphically show how machine tools increase employment and raise the standard of living. Juan B. Larrinaga, nationally famous mural artist, planned the exhibit and designed the dioramas.

Informality Sometimes an Asset in Production Control

By FRANCIS A. WESTBROOK

Consulting Engineer



THE Heald Machine Co., Worcester, Mass., has developed a simple and effective system for production control which serves its needs admirably. The present arrangement has been in operation for about two years and was adopted because of the changing character of the company's business. Formerly the products consisted of several lines of standardized boring

and grinding machines which could be manufactured for stock on more or less of a production basis. Of late years, however, it has become more and more necessary to manufacture according to customers' specifications, and practically all of them are different.

The question naturally arose how to handle this great diversity of orders and get them through the various departments and out of the

shop on time. It is, of course, a problem with which many machine tool builders have to cope nowadays, and which has been handled in many ways. The Heald Machine Co. has found it efficient, and practicable, to do it in an unusually informal and personal manner. Forms and highly developed schedules have been avoided.

Every Monday morning there is a meeting of the heads of all the

EVERY Monday department heads meet with the president to discuss the status of all orders as presented on a list, of which this is a sample. The entire list, numbering a dozen pages or more, is divided into shop sections, usually starting with the paint shop, experimental, fixture test, etc. The sample indicates the machines spotted in one of the assembly bays, with scheduled dates for other operations as decided upon at the last meeting.

Dec. 3			Assem.	Eng.	Prod.	Parts	Line	Test	Fixt.	Ship
<u>Line Section 5 (cont'd)</u>										
M-2908	#6552	25028				12/12	12/23	1/6		
Heald Dem.	#25A-16"									
M-2925	#6243	22025				12/16	12/23	1/2		1/6
Cleveland	#22-BD to Chuck									
<u>Line Section 6</u>										
M-2899	#6310	72079				12/16	12/26	1/6	1/13	1/16
Smith	#72 Duplex									
M-2912	#6527	72087				12/16	12/26	1/6	1/13	1/16
Niles	#72-3 MD P1									
M-2946	#6302	48011								
National	#48A		12/9	12/12	12/23	12/26	1/2	1/6		1/9
M-2946	#6303	48011								
National	#48A		12/9	12/12	12/23	12/26	1/2	1/6		1/9

departments under the direction of Roger Heald, president of the company. At this meeting the status of every order is gone over in detail. Of course, each order is given a shipping date and must progress through each department in some order that it may be ready when promised. Consequently these meetings are attended by the heads of the sales department, engineering department, inventory department, machine shop, sub-assembly and assembly departments, and the testing department. These men get together around the table, state what they want and what they can do, and thresh out each order separately.

Such a procedure might not be practicable in some organizations. In the first place, a good many shops could not keep functioning properly with the heads of so many of the departments at a meeting for several hours. The reason why this is not a serious drawback here is because there is a large nucleus of skilled men who have been with the company for years. They know their work thoroughly and the foremen in direct charge are all old-timers. They can be given instructions for some time ahead and can be trusted to carry them out, and to use their heads when necessary.

The same is true of the department heads who attend these meetings. They know each other and each others' problems, as well as the customers' requirements. The

shop men know what they can do in turning out parts and assemblies, and the conditions in the shop at any given time. For the great variations in orders this has proved to be a very satisfactory method of controlling production in this plant. It eliminates buck passing, avoids chaotic conditions in the shop and provides the necessary degree of cooperation with the sales department, which must satisfy its customers.

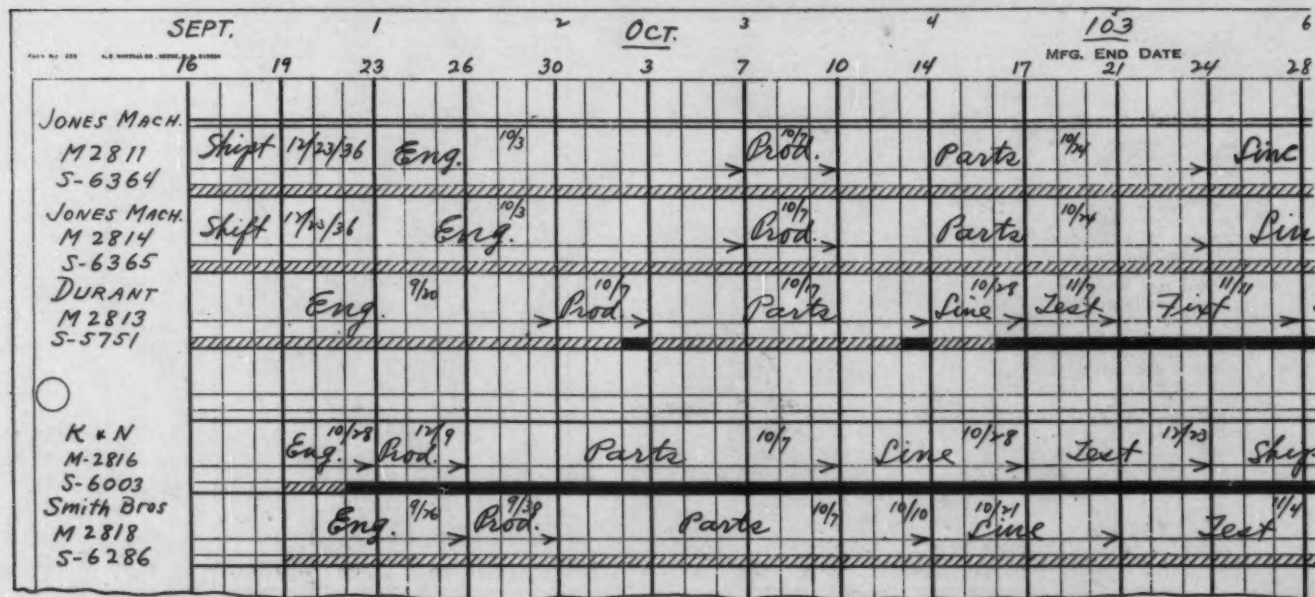
The procedure at the meetings is very simple. Each one who attends, and no excuses for non-attendance are accepted and no interruptions are permitted, has a list of every order and its status. These lists carry the order number and name of the customer and have a series of parallel vertical columns for the principal steps in production, such as engineering work, production of the parts, line assembly, testing, putting on the customer's particular fixtures, and shipping. In addition to this, the list of orders is divided into what work is (at the time of the meeting), in the various departments such as the paint shop, the experimental department, fixture testing, and the different assembly sections. As the discussion of each order goes on, the dates decided upon, and agreed upon, are entered in the appropriate columns. These columns also have the dates entered which were agreed upon at previous meetings so that it is clearly apparent whether the orders are progressing

as planned. If they are not progressing as planned, the group decides what to do about them. As all of the departments are represented, it is often possible to overcome unforeseen delays because each one can make a special effort to put pressure on a certain order when circumstances make it desirable to do so.

In addition to these lists, Mr. Heald, under whose direction these meetings are held, has a master chart which is divided into vertical columns covering each work day for 10 weeks. The horizontal divisions are for each machine as given on the lists furnished to the department heads. In these horizontal divisions there is a double line, the space between which is filled in with either a blue or red pencil. Blue indicates that the work is progressing as planned, and red that it is behind time. In the space above the colored line is written the name of the department where the job is located, and arrows at the vertical lines representing dates show when it enters and leaves each department.

Data from the lists are transferred daily to the chart, so that it is possible to tell at a glance how things are going in the shop. In rush times there may be some red, and at other times mostly blue, showing that there is no congestion. Some orders may lag all the way through, and others keep to the schedule most of the time with only here and there a setback.

On the master control chart is shown the status of each order. Based upon the Gantt chart idea, blue progress bars show work on time; red (black), those behind the original schedule.



Portland Cement Binder for Foundry Molding Sand



CARL A. MENZEL
Research Engineer,
Portland Cement Association

A TIMELY paper dealing with the use of a portland cement as a binder in foundry molding sand was presented to members of the American Foundrymen's Association, at its annual convention, Milwaukee, May 3, by Carl A. Menzel, research engineer of the Portland Cement Association.

Mr. Menzel pointed out that there are several points which bear on the general success or failure of almost any binder in foundry sand molds. Briefly, it is desirable that after ramming, the mold have high "green" strength so that it can be handled without damage until the time the steel is poured a few days later. The surface of the mold should be hard and the mold should be strong, but not too strong as it is desirable that it yield somewhat under pressure of the steel as it solidifies. The mold should contain as little moisture as possible, particularly at the surface, in order to avoid the sudden formation of steam. It must also be permeable for the escape of gases, but the sur-

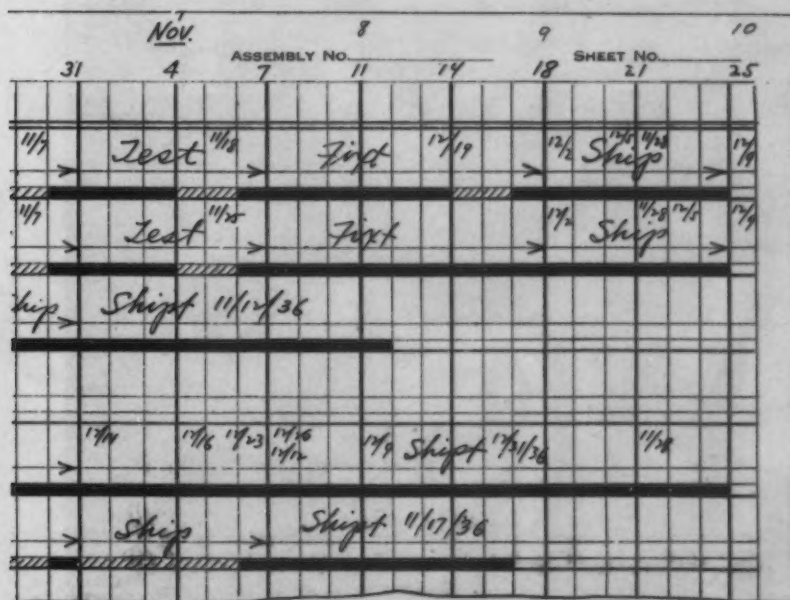
face must at the same time be clean, smooth and hard so as to provide a smooth surface on the casting. It is very important that the mold surface be free from materials which will lower the fusion point between the steel and the silica sand. Lime is particularly objectionable on the surface of the mold for this reason.

It was apparent from the beginning, according to Mr. Menzel, that to maintain proper control and to secure uniform results with cement binder the face of the mold would have to be made from a carefully proportioned mixture of cement, suitably graded fresh, clean sand, and water. It seemed also that such a high-grade facing layer approximately 1 in. thick could be backed up with any suitable combination of lower grade materials. The studies were carried out assuming such a combination would be necessary in practice. For instance, under one plan of operation all of the material available from a mold made of both high-grade cement-

bound facing and a lower grade of cement-bound backing may be crushed and returned to individual sand grains to make the mixture to be used for back-up in the next molding. This mixture will contain some hydrated or spent cement. When it becomes loaded with too large a quantity of spent cement with repeated additions of new cement, the excess fines can be easily blown out. Under another plan the entire cement-bound mold may be crushed to form particles of varying size up to $\frac{3}{4}$ -in. or more, to which new cement is added to form backing material simulating very lean concrete. Under a third plan the back-up may consist of lightweight aggregates such as slag, cinders, or burned shale (Haydite) held together by cement.

Whatever methods or materials are employed for backing up the facing, Mr. Menzel emphasized that one essential for success is a good facing layer of well-graded fresh, clean sand combined with the proper amount of cement and water. The re-use of the facing sand after the first mixing with cement results in a mixture having markedly lower strength and increased permeability even though as much new cement has been added as was used originally. It is doubtful whether the spent cement adhering to the sand grains can be removed sufficiently to return the sand to its original condition. The adhering cement separates the sand grains and not only reduces the strength and increases the permeability of the facing but alters the surface characteristics and increases the undesirable lime constituents at the surface of the mold. This creates a condition favorable for "burning-in" and fusion with the steel. It, therefore, appears that uniformity in results can be

(CONTINUED ON PAGE 94)



Machine Housings Welded to



WHEN limits on machined surfaces almost beyond the fringe of commercial practicability are combined in a welded structure in which the customer further specifies an overweight penalty of 50c. a lb., a job weldery is up against about the fussiest job that one could imagine. The attempt to keep the weight to a minimum has introduced refinements that have increased the practical difficulties. Sections, for example, vary in thickness from $\frac{1}{4}$ to $2\frac{1}{4}$ in., whereas in commercial machine base work, a standardization of plate thickness might well be in order on the basis of simplification of the stock problem. When sections varying widely in thickness are employed, the subsequent annealing which is essential for this class of work, is very likely to cause warpage unless all factors are under close control.

The two units whose construction is to be described are special machinery housings, the general design and construction principles of which are the same, although the sizes vary. The material used is SAE 1020 rolled steel. The work was performed by the fabricating division of the Taylor - Winfield Corp., Detroit.

Extreme Accuracy Required

Accuracy must be held to within $\frac{1}{32}$ in. on all surfaces prior to machining and the machined tolerances are within toolroom limits. Extreme accuracy is necessary to assure proper alinement with shaft and flange connections on adjacent assemblies. For this reason, it is a requirement in the finished housing that three bores in line must check respectively within 0.0002 in. in height from the scraped base surface — a surface that is scraped

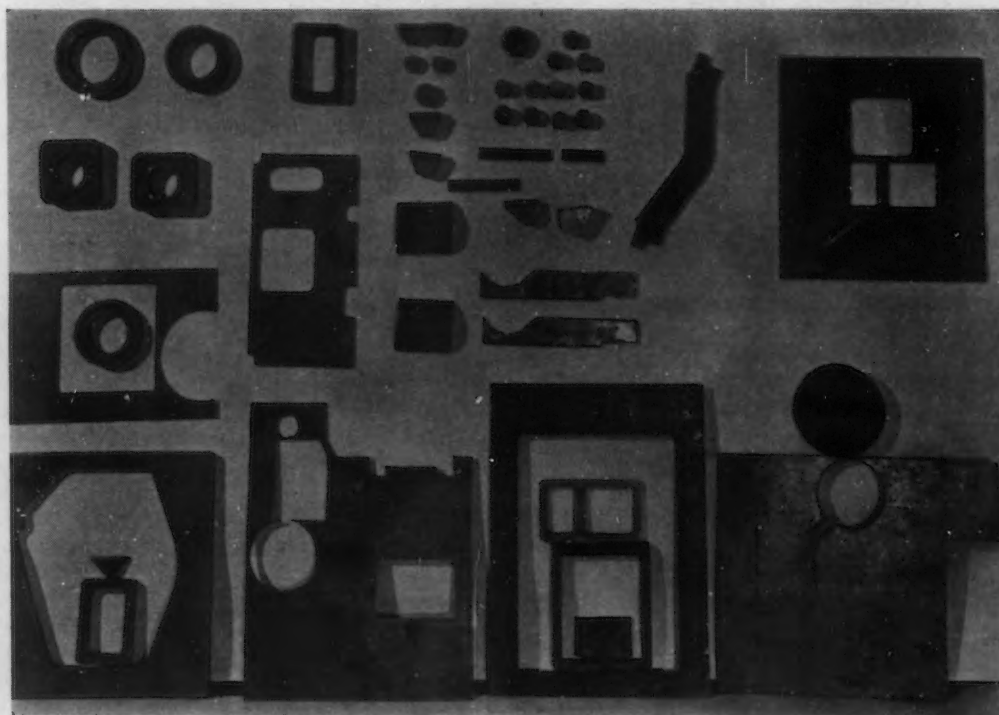
principally to obtain a proper lubricant seal without the necessity of a gasket.

There are several shop principles that must be observed in handling work of this character, to wit:

- (1) Control of dimensions and weight begins with the component pieces.
- (2) Initial assembly of the units by tack welding must be done by actually "laying out" the work on an accurate face plate, just as in toolroom practice.
- (3) Weld rod diameter and hence fillet size must be held to a minimum to avoid spread of the heat and subsequent distortion during welding.

Fig. 1 shows the variety of shapes and sizes of pieces that compose the welded housing. Fig. 2 the job is shown before and after machining. It should be noted that all bosses and flanges are set through the work and therefore are welded

FIG. 1—Practically all the component pieces of this welded machine housing are flame cut by a templet - guided torch and are checked against master templets. Feet and small bosses are shaped from bar stock, later cut into segments. The pieces make up the welded assembly shown on opposite page.



Close Limits

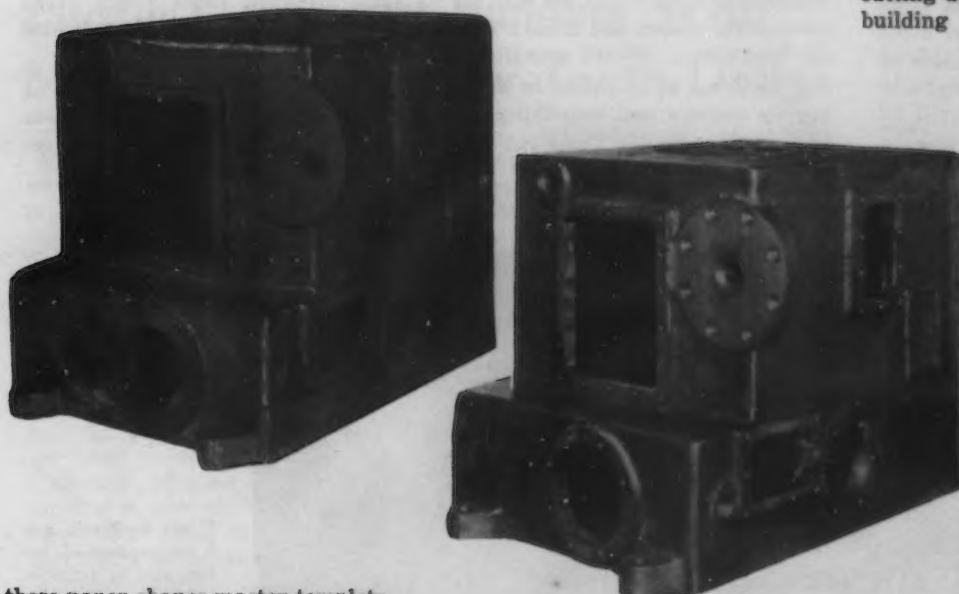
By FRANK J. OLIVER
Associate Editor, *The Iron Age*

from both sides. With the exception of the feet and a few small bosses, that are drilled and tapped, all pieces are flame cut in a set-up shown in Fig. 3. In preparation for this work, each boss or wall section is detailed on heavy drawing paper and templets are cut out. From

layouts, and once set, produce identical pieces for the entire run, which in this example was about 40 housings. The customer supplied only a drawing of the welded assembly, which had to be detailed by Taylor-Winfield for this welding technique.

Where there is a duplication in one housing of several small pieces

steel square, scribber and height gage while his helper tack welds it in place. Fig. 4 shows this operation. The same punch marks also serve as reference points when checking the assembly on the same face plate after annealing. An error in center location before machining of over $1/32$ in. must be corrected in order that mating flanges will match. This is done by cutting down one side of a boss and building up another, but the



AT LEFT
FIG. 2—The larger machine housing before and after machining. The hole bored through the flange must check within 0.0002 in. from the scraped base.

these paper shapes master templets are made of No. 16 gage steel against which each piece is checked after flame cutting. The paper templets are also used in checking the cutting templets. These are constructed of plywood grooved for holding an aluminum guide strip $1 \times 1/16$ in. in section. Allowance is made for the cutting kerf of the torch. The outside strip (when several pieces are cut out of the same blank) is simply tacked to the plywood board.

In Fig. 3, two rectangular bosses or frames are being cut out in addition to the main blank which forms a wall section. This procedure reduces the scrap. The templets are carefully checked against the paper

such as pedestal feet, the components were sawed from round or square bars, the contours of which had been formed in a planer. This method was faster than flame cutting and reduced the time of finishing.

Pieces Are Centerpunched for Layout

After flame cutting and before assembly, all parts are centerpunch marked in the center and at four points near the periphery. This marking enables the assembly men to line up the piece accurately by

amount of such work is obviously small.

To meet the customers' welding specifications for welds other than fillet welds, it was necessary to bevel the plates to obtain 100 per cent penetration. This beveling was done by the cutting torch, either by machine or by hand. The machine which was especially devised for this work, is much more accurate than the hand method and gives a cleaner cut, but is limited in application to straight-away runs. Arc welding is done with $3/8$ to $1/2$ in. Lincoln or Murex coated



FIG. 3—Accurate duplication of parts on quantity runs is assured by using templets. Dual torches save time and scrap is held to a minimum by making use of stock within blanks.

rods, supplied with current from an a.c. machine.

Commensurate with this class of work, all welds are ground and any splatter metal must be removed by hand or air chisel. Otherwise, a

loosened particle might get into the lubricating system and cause a serious breakdown. Pencil grinding is also used to a great extent in cleaning up corners and smoothing out irregularities in the flame cut sur-

face, although these rough areas are relatively few and small in size with machine cutting.

The finished job is annealed at 1250 deg. F. for 2½ hr. and is then cooled 5 hr. in the furnace, the re-



FIG. 4—Blanks are centerpunched on two axis to assist in lining them up while tack welding in place. After welding and annealing, the work is "laid out" with height gage and square on the same faceplate to check location of centers. This is the smaller housing.

mainder of the time in air. Sand-blasting follows in order to remove scale and clean the housing thoroughly prior to inspection. In this operation the key surfaces are whitewashed and the centers are actually "laid out" on the work with a scribber and checked against the punch marks.

It is apparent that toolroom accuracy is used throughout the operations and the work is checked at every stage. Yet this carefulness has not been carried beyond commercial extremes, since the work had to be done at a competitive price. Naturally, a lot of cost corners were cut as experience on the job indicated. Without doubt, this is probably the most accurate piece of arc welding work that has been done on a quantity basis today.

FIG. 5 — The smaller housing after machining. For appearance sake as well as for weight considerations (50c. a lb. penalty for overweight), flange outside diameters must be concentric with the bores within 1/32 in.



Austin Erects First Building With New Rigid Frame Saw-Tooth Design

THE first industrial plant to employ the new welded rigid frame saw-tooth design recently developed by the Austin Co., industrial engineers and builders, Cleveland, is being erected at Meriden, Conn., for the International Silver Co. This new type structure, with modern exterior distinguished by continuous horizontal runs of sash, will obtain 100 per cent availability of space from floor to roof by the elimination of all cross members and trusses. Clearance, ranging from 14 ft. at the top of special "tree-form" columns to 27 ft. at the peak of each saw-tooth, is obtained by welded room members which span 10 40-ft. aisles. This will allow for maxi-

mum flexibility of operations throughout the plant, which will be devoted to the stamping and buffing of the company's well-known flatware lines.

The roof design, which applies natural tree forms to eliminate all cross members and trusses, facili-

tates daylighting through the saw-tooth monitors, which face to the north to insure maximum uniformity of light. Artificial light will be provided by a combination of mercury vapor tubes and Mazda bulbs to maintain 20 foot-candles of light throughout the plant.

The roof deck has been constructed of insulated metal, and inasmuch as drop hammers are to be installed throughout the stamping department, special acoustical treatment is being provided over

TEN 40-ft. aisles will provide usable space from floor to roof in the International Silver Co.'s plant now under construction at Meriden, Conn. It is the first to apply the new rigid frame saw-tooth design developed by Austin Co. engineers. The natural "tree-form" columns which will carry the saw-tooth roof for the International Silver factory were fabricated in the Austin Co. shops at Cleveland.



an area of about 8000 sq.ft., to absorb the noise of the hammers. The floor is being built up on a concrete sub-base 6 in. thick, in which creosoted timbers will be embedded. It will be surfaced with factory maple on a wood base, except in the locker and toilet sections, where monolithic concrete will be used.



FIG. 3—Accurate duplication of parts on quantity runs is assured by using templets. Dual torches save time and scrap is held to a minimum by making use of stock within blanks.

rods, supplied with current from an a.c. machine.

Commensurate with this class of work, all welds are ground and any splatter metal must be removed by hand or air chisel. Otherwise, a

loosened particle might get into the lubricating system and cause a serious breakdown. Pencil grinding is also used to a great extent in cleaning up corners and smoothing out irregularities in the flame cut sur-

face, although these rough areas are relatively few and small in size with machine cutting.

The finished job is annealed at 1250 deg. F. for 2½ hr. and is then cooled 5 hr. in the furnace, the re-



FIG. 4—Blanks are centerpunched on two axis to assist in lining them up while tack welding in place. After welding and annealing, the work is "laid out" with height gage and square on the same faceplate to check location of centers. This is the smaller housing.

mainder of the time in air. Sand-blasting follows in order to remove scale and clean the housing thoroughly prior to inspection. In this operation the key surfaces are whitewashed and the centers are actually "laid out" on the work with a scribber and checked against the punch marks.

It is apparent that toolroom accuracy is used throughout the operations and the work is checked at every stage. Yet this carefulness has not been carried beyond commercial extremes, since the work had to be done at a competitive price. Naturally, a lot of cost corners were cut as experience on the job indicated. Without doubt, this is probably the most accurate piece of arc welding work that has been done on a quantity basis today.

FIG. 5 — The smaller housing after machining. For appearance sake as well as for weight considerations (50c. a lb. penalty for overweight), flange outside diameters must be concentric with the bores within 1/32 in.



Austin Erects First Building With New Rigid Frame Saw-Tooth Design

THE first industrial plant to employ the new welded rigid frame saw-tooth design recently developed by the Austin Co., industrial engineers and builders, Cleveland, is being erected at Meriden, Conn., for the International Silver Co. This new type structure, with modern exterior distinguished by continuous horizontal runs of sash, will obtain 100 per cent availability of space from floor to roof by the elimination of all cross members and trusses. Clearance, ranging from 14 ft. at the top of special "tree-form" columns to 27 ft. at the peak of each saw-tooth, is obtained by welded room members which span 10 40-ft. aisles. This will allow for maxi-

mum flexibility of operations throughout the plant, which will be devoted to the stamping and buffing of the company's well-known flatware lines.

The roof design, which applies natural tree forms to eliminate all cross members and trusses, facili-

tates daylighting through the saw-tooth monitors, which face to the north to insure maximum uniformity of light. Artificial light will be provided by a combination of mercury vapor tubes and Mazda bulbs to maintain 20 foot-candles of light throughout the plant.

The roof deck has been constructed of insulated metal, and inasmuch as drop hammers are to be installed throughout the stamping department, special acoustical treatment is being provided over

TEN 40-ft. aisles will provide usable space from floor to roof in the International Silver Co.'s plant now under construction at Meriden, Conn. It is the first to apply the new rigid frame saw-tooth design developed by Austin Co. engineers. The natural "tree-form" columns which will carry the saw-tooth roof for the International Silver factory were fabricated in the Austin Co. shops at Cleveland.



an area of about 8000 sq.ft., to absorb the noise of the hammers. The floor is being built up on a concrete sub-base 6 in. thick, in which creosoted timbers will be embedded. It will be surfaced with factory maple on a wood base, except in the locker and toilet sections, where monolithic concrete will be used.

Conveyors Motivate the Continuous

Chapter 12 of a Comprehensive Series on the Economics of Materials Handling Methods and Equipment

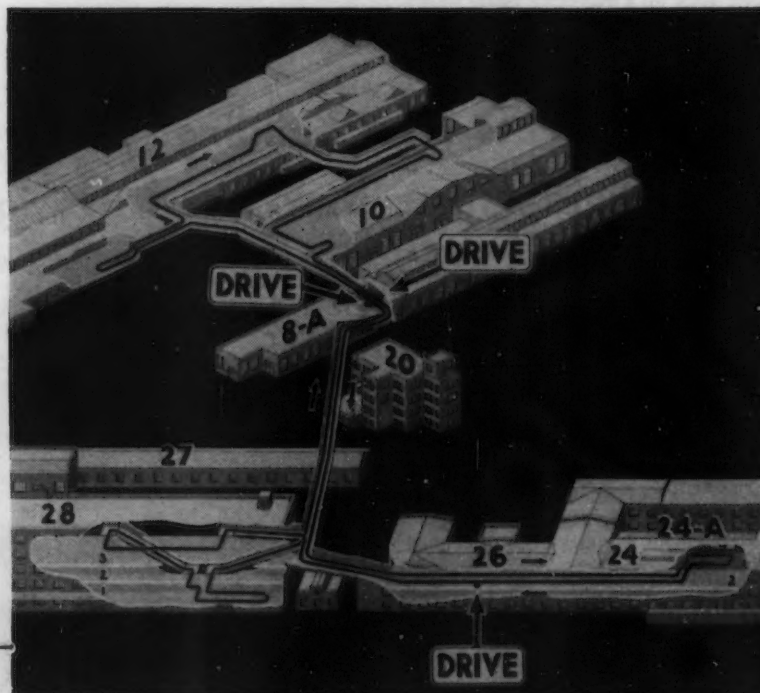
methods require that the installation must be planned as a whole, not as a series of unrelated moving jobs."

Back of this statement, which is as sound as a pre-depression dollar, lies a very important idea; implied in the statement, but seldom com-

pletely expressed anywhere. It is the principle of continuous flow, which vitalizes and makes possible modern, economical production methods. Brought to its highest peak in the automotive industry, the principle means simply this: All effort throughout an entire



SOME little while ago the editor of a contemporary business magazine opened a discussion of materials handling methods with these words: "Where nine plant managers out of ten make their mistake in mechanical handling is in their approach to the problem. 'We have to move this stuff from here to there,' they say to themselves. 'There's quite a lot of it to move every day. We'd better put in one of those Blank Doochiekeys to move it.' The factory executive who takes hold of the job with no further thought about it than this fails to grasp the major possibility of profit in moving goods and materials mechanically. The money-making possibilities behind modern handling



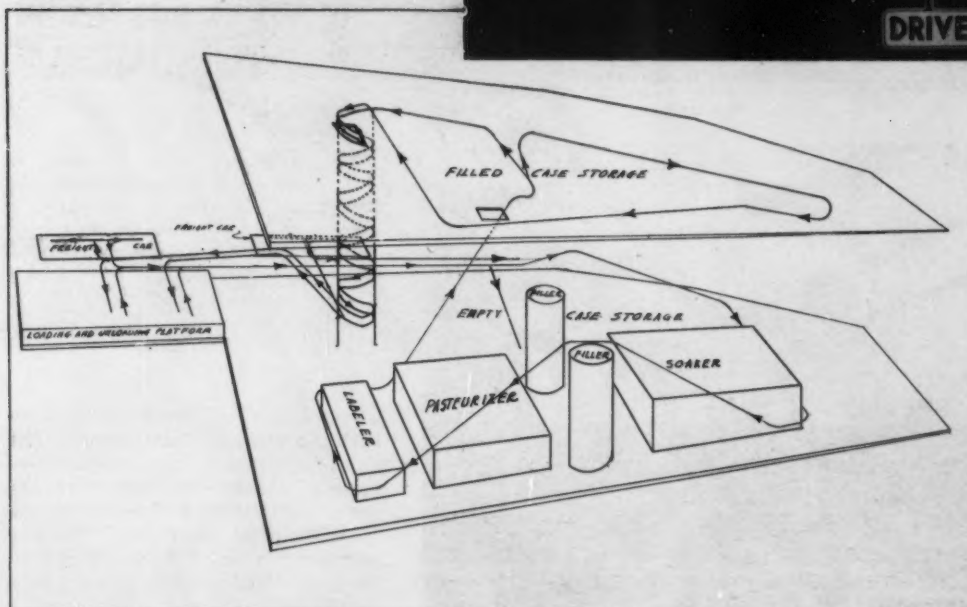
ABOVE

FIG. 2—Layout of interdepartmental conveyor system, refrigerator division of General Electric Co. at Schenectady, N. Y., showing coordination of manufacturing for a complex production problem.

o o o

AT LEFT

FIG. 1—Layout of Lamson conveyor system in bottling plant of Genesee Brewing Co. at Rochester, N. Y., showing coordination of processes for a simple production problem.



Flow Principle

By FRANCIS JURASCHEK
Consulting Editor, *The Iron Age*

manufacturing plant should be directed, in terms of time and space, toward moving materials through processes or operations *progressively* to a finished state, without loss of motion, and in such a manner that interruptions to production, for any cause, do not occur.

More than any other class of mechanical handling equipment, the conveyor has been responsible for motivating the principle of continuous flow. For the conveyor, in any or all of its forms, combines two features essential to the continuous flow idea: It moves goods progressively forward, and it is ideally suited to tie together many diverse operations into a unified system of production.

The conveyor takes many forms. It may be a moving belt of leather or rubberized fabric running over rollers; it may be a metal screen belt; it may be a system of rollers

over which packages, cases, trays or large parts having at least one flat surface move by gravity, or are caused to move onwards because the rollers are made to turn mechanically; it may be a channel through which a moving belt or chain equipped with projecting

lugs pushes the material, or in which a turning screw forces loose bulk material forward; it may be an overhead chain or belt with suspended carriers on which parts are hung; it may be a tube through which a flow of air forces a snugly fitting container, or through which



ABOVE

FIG. 4—Bearing races are carried through heat treating furnace, then automatically diverted to bins at inspection tables, on a Mathews powered metal screen conveyor.

AT LEFT

FIG. 3—Bearing balls in tote pans are brought on a Mathews gravity roller conveyor to a scale section, weighed, then automatically elevated to high level gravity roller conveyor leading to assembly room.

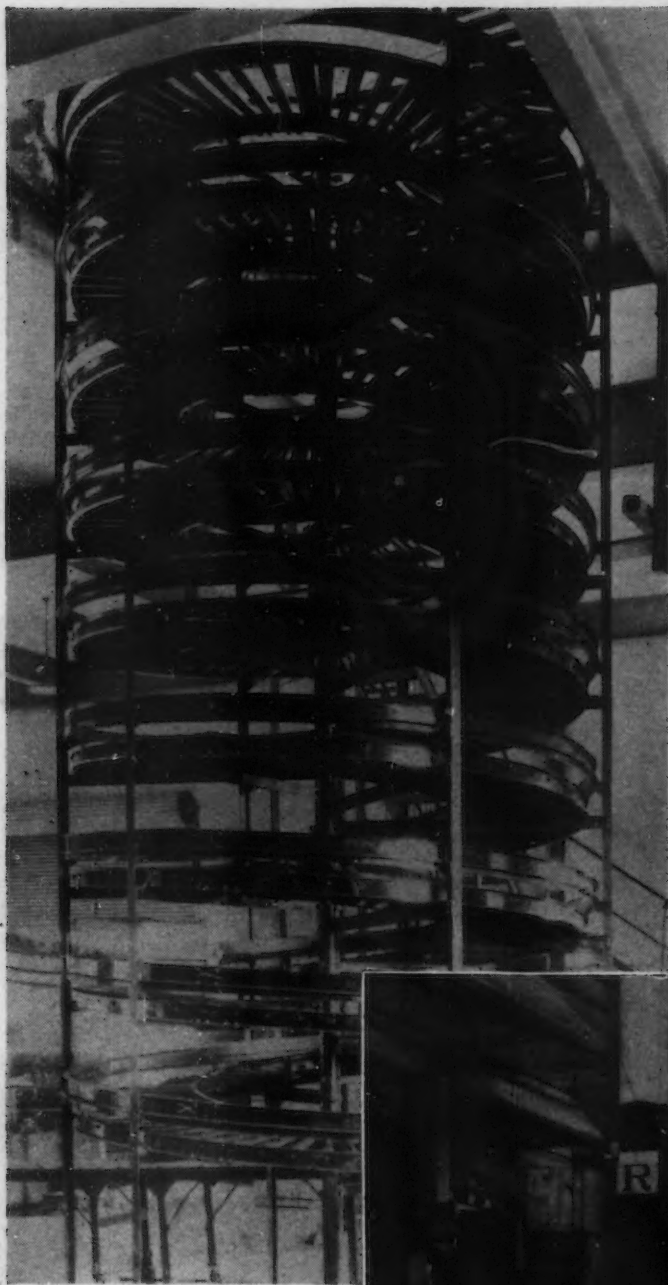


FIG. 5—Standard Conveyor gravity roller spiral chute taking cases from upper floor to shipping floor and discharging onto a portable roller conveyor.

tems (these will all be considered in detail later) we may roughly divide conveyor systems into two parts; light duty and heavy duty types. The first will be considered here; the second a fortnight hence.

Coordination

In considering the functions of conveying equipment it should be borne in mind that not only are conveyors used to move goods from here to there expeditiously and economically, but they are likewise used to tie together the varied processes of production throughout the plant. An excellent illustration of these two-fold functions is contained in the following description of a Lamson conveyor installation in the bottling plant of the Genesee Brewing Co., at Rochester, N. Y.

Fig. 1 is an isometric drawing of this plant, containing the largest single pasteurizing unit in the country. The plant handles 600 cases of beer each hour.

Empty cases of bottles are un-

air or steam forces loose bulk materials; it may be an overhead cable or track on which a suspended carrier runs.

Whatever the equipment, movement continuously forward may be effected in horizontal or vertical planes, or along an inclined plane either upwards or downwards. Chutes, straight, curved or spiral, develop logically from horizontal conveyors to transfer goods by gravity from a higher to a lower level; elevators, both vertical and inclined, develop logically from a horizontal conveyor to transfer goods by power from a lower to a higher level.

Without at this time entering into the details of bucket elevators, skip-hoists and pneumatic tube sys-



FIG. 6—Chain Belt power driven slat conveyor set flush with floor in order make-up department of a wholesale grocery distributor's warehouse. A curved chute brings packages to this conveyor from an upper floor.



FIG. 7—Standard Conveyor installation in box-making shop, showing three lines of gravity roller conveyors feeding through a common switch to a single discharge line.

loaded at the railroad platform from freight cars and go on the conveyors indicated either to the empty case storage in the plant, or to the bottle soaker. As the cases pass the soaker the bottles are removed by hand and put into the soaking machine, from whence they go progressively to the filling machines, the pasteurizer and the labeling machines. Meanwhile the empty cases have gone around these machines, and as the bottles issue forth from the labelers, they are placed in the cases, and the cases move onwards either to the filled storage on the second floor, or direct to the railroad platform for shipment. From the filled storage rooms on the second floor cases are taken as needed, placed on a gravity conveyor leading to the spiral chute, whence they are delivered



FIG. 8—Mathews gravity roller conveyor of trough-section delivering heavy rolls of paper from storage to a carton-making room.

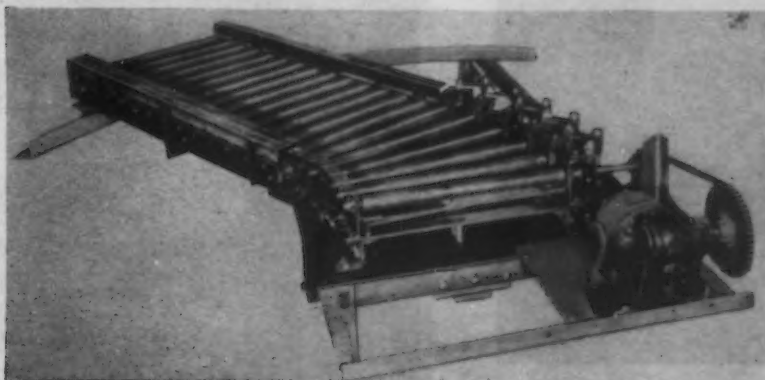
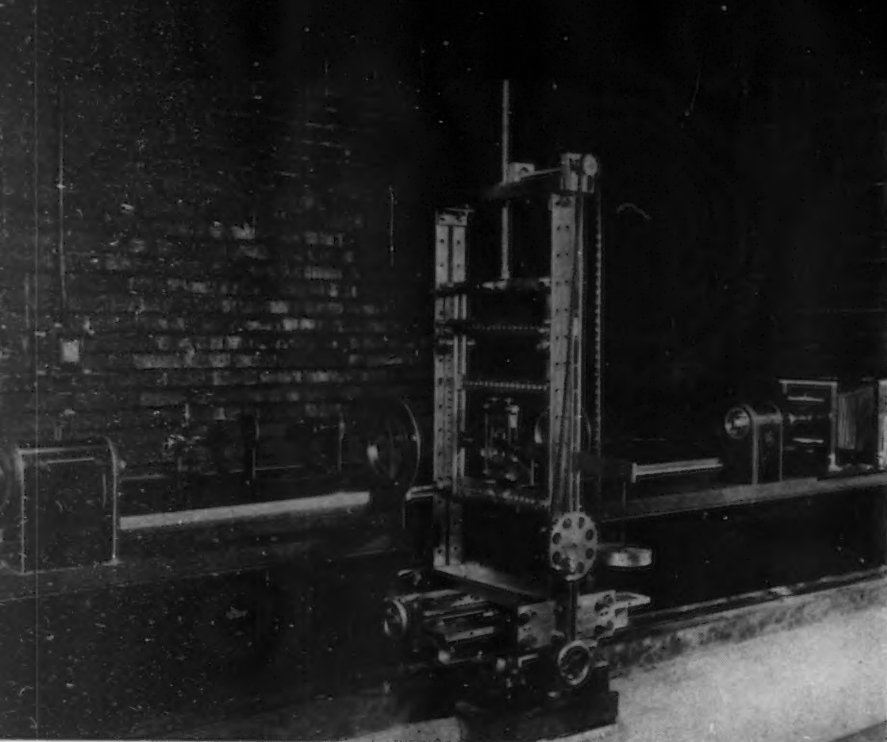


FIG. 9—Full-powered radial switch by Standard Conveyor Co. Push-button operation swings switch section to branch line conveyor for diversion of commodities, after which the switch returns automatically to normal running position.

directly to the hands of the loaders on the shipping platforms.

The conveying equipment involved in all these operations coordinates every movement and makes the entire bottling plant a single, self-contained unit, in which production moves forward continuously without a hitch. In the equipment used are gravity roller conveyors, belt booster and push bar booster conveyors, switch conveyors, portable belt conveyors, and a double-bladed spiral chute. All are designed to function cooperatively, and to assure a constant movement of bottles to and from each piece

(CONTINUED ON PAGE 94)



Timken Expands

ON these pages one sees evidence as practiced by Timken Roller company's single story, brick probably the most complete testing, by scientific means, of specialized product producer. Not in this laboratory, but chemical

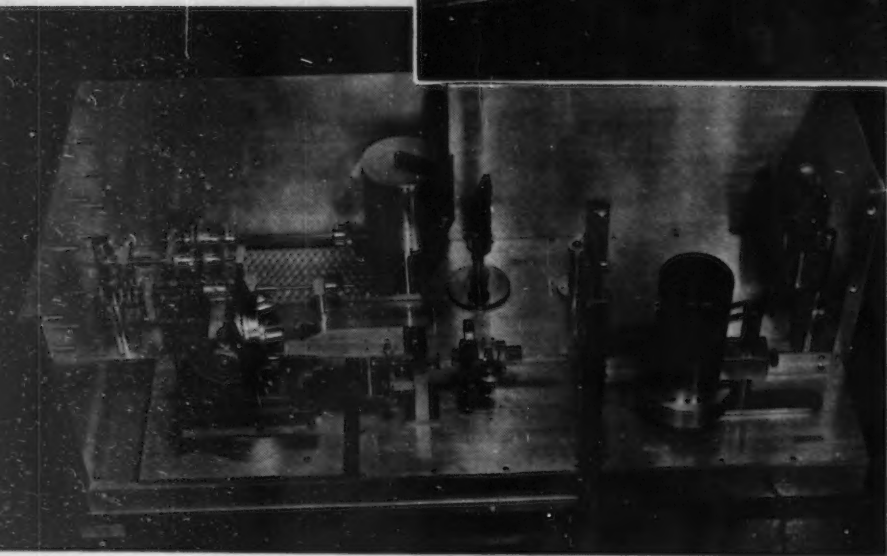
ABOVE

ONE of the largest and most elaborate set-ups for photoelastic testing.

o o o

AT RIGHT

THESE machines test bearings up to 8 in. o.d. to destruction under both thrust and radial loads.



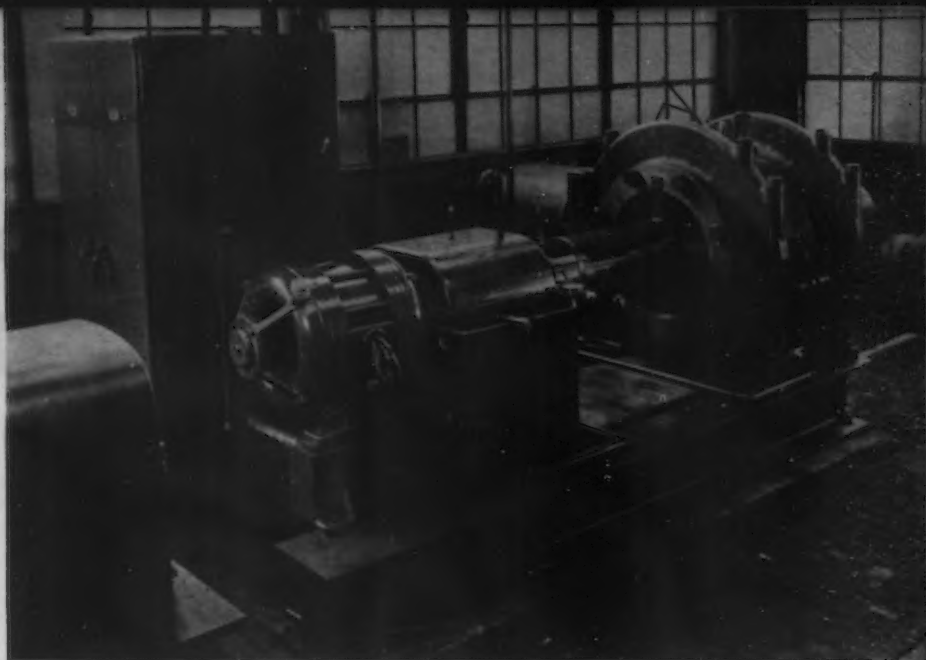
TWO profilographs, capable of vertical magnification to from 2000 to 5000 times, are installed in an air-conditioned room. These are used for checking surface finish.

o o o



Research Facilities

of the forward march of research Bearing Co., Canton, Ohio. In this laboratory is to be found what is equipment for the inspection and the materials and products of a only are physical determinations made and metallurgical as well.



ABOVE

S AID to be the largest bearing testing machine extant, this one is capable of taking care of bearings up to 24 in. o.d.

o o o

AT LEFT

D EFLCTIONS of auto rear axles are measured in this machine, capable of absorbing 20,000 ft. lb.



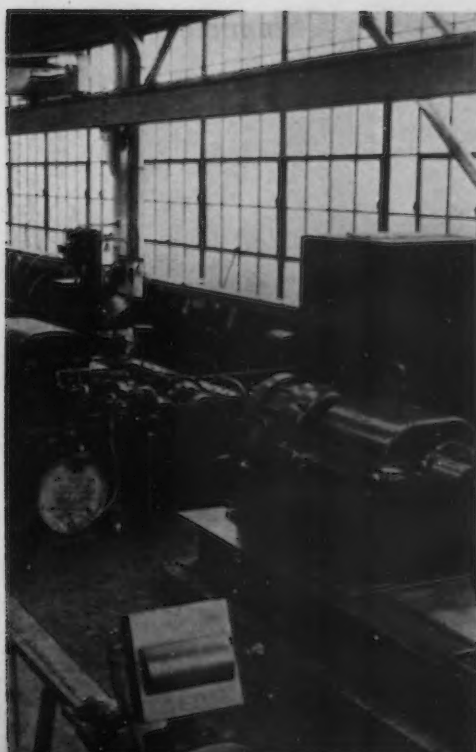
ABOVE

A UTO rear axles and transmissions are tested, together with their bearings, in this specialized apparatus.

o o o

AT LEFT

G ENERAL view of the main room of the new Timken laboratory.





A. E. WHITE
President for 1937-38

POSSIBLY because it was held in so populous a center, where many engineers and executives were able to attend without undue interruption to their business, the 40th annual meeting of the American Society for Testing Materials, held in New York at the Waldorf-Astoria, broke all records for attendance. Not including those who merely visited the testing equipment exhibit (held every two years), the attendance total was 1535. Last year 1131 registered for the technical sessions at Atlantic City. At this year's meeting, running from June 28 to July 2, another record was established in that 53 new tentative specifications and tests were approved by the membership, indicating the enlarged activities of the many committees of the society.

In the annual address, retiring president Arno C. Fieldner, chief, technologic branch, U. S. Bureau of Mines, discussed the broad subject of fuels. Tracing the rise of petroleum fuels and the decline of coal fuels since he entered the Government service in 1907, Mr. Fieldner predicted that coal will continue to be the principal fuel used for the generation of public utility and major industrial power, but that it will be burned more efficiently. He sees no substitute for metallurgical coke, but envisioned wider use of the by-product gases industrially. Stoker-fired domestic furnaces will tend to halt the inroads being made by oil in house heating. The trend observed in marine transportation of using oil as the chief fuel will be continued and more of it will be in the form

Attendance Breaks All Rec Held in New York,

of diesel fuels. About 40 per cent of marine fuel went into diesels in 1936. As to motor fuel supply, while admitting definite limitations on the gasoline supply, Mr. Fieldner believes that the wider use of diesels here also will tend to conserve the supply. As needs increase, hydrogenation of low-temperature tar, shale oil and coal itself and the synthesis of hydrocarbons from water gas and alcohol from fermentation processes will take over as much of the load of supplying fuels for internal combustion engines as may be required. None of these new fuels can hope to be as cheap as our present petroleum fuels, however.

Lecture on Plastics

The twelfth Edgar Marburg Lecture, an annual feature, was delivered by Dr. T. Smith Taylor on the subject of Plastics. For a number of years Dr. Taylor, who is professor Physics, Washington & Jefferson College, was chief research physicist of the Bakelite Corp., prior to which he was re-

search physicist of Westinghouse Electric & Mfg. Co. He was instructor at the University of Illinois for several years; also research fellow at the University of Manchester, England, and then instructor and assistant professor of physics at Yale, the university at which he received his degree in 1906 and doctorate in 1909. At present he is chairman of Committee D-9 on electrical insulating materials of the A.S.T.M.

In his lecture, Dr. Taylor gave a very scholarly review of all the plastic materials, their properties and application, beginning with the natural resins and gums. Including rubber compounds in the plastic group, he commented on the great possibilities for synthetic rubber since it can be synthesized to meet practically any operating condition. One of its chief advantages is that it is more resistant to gasoline and oil than is natural rubber.

Celluloid was one of the earliest plastics commercially used and as an offshoot of it today, we have

Members of Executive Committee



R. L. TEMPLIN



H. C. MOUGEY

ords at A.S.T.M. Meeting

June 28 to July 2



H. H. MORGAN
Vice-President for
1937-1938-1939

Pyroxylin or cellulose nitrate. Cellulose acetate is rapidly replacing this material, however, because it is slow-burning. Ethyl cellulose is another similar plastic. Phenolic resinoids still lead in the thermo-setting types of plastics and Dr. Taylor pointed out some of the severe-duty applications in which the laminated materials with phenolic base are being used. He also mentioned urea formaldehyde compounds, forming a clear resin, with pure white possibilities. Other thermo-setting types included furfural resins and vinol resin, a polymerization compound. Acrylic resins are finding use in artificial glass that is non-breakable. Many other less common varieties were mentioned by Dr. Taylor, including the casein plastics.

Attempts to test plastics in tension have met with some reverses in that it was difficult at first to avoid the crushing influence of the grips. As a result today there has been developed a test blank that changes both in thickness and in

width from the point of minimum section which is $1 \times \frac{1}{4}$ in. by $\frac{1}{8}$ in. long. Using a 3-in. radius of curvature, this section is developed to $1\frac{1}{4} \times \frac{1}{8}$ in. at the grip and is found to eliminate all compressive influences of the grips.

Doctor White is New President

A. E. White, professor of metallurgical engineering, and director, department of engineering research, University of Michigan, was elected president of the society for 1937-38. Following his graduation from Brown University, 1907, and a year of study at Harvard, Doctor White was in charge of research on blast-furnace by-products, ores, etc., for Jones & Laughlin Steel Corp. In 1911 he became instructor at the University of Michigan. He has held his present positions since 1919. From 1917 to 1919 he served in the Ordnance Department, U. S. Army. He is now Lieutenant-Colonel, Ordnance Reserve Corps. Doctor White is chairman of the A.S.T.M. steel commit-

tee's group on materials for high-temperature service. He was the first president of the American Society for Metals and is a past-chairman of the research committee, American Society of Mechanical Engineers. In 1925 Brown University awarded him the honorary degree of Doctor of Science. From 1933 to 1935 he was a member of the A.S.T.M. Executive Committee and has just completed a term as vice-president.

H. H. Morgan, manager, rail and track fastenings department, Robert W. Hunt Co., Chicago, has been elected vice-president for two

(CONTINUED ON PAGE 66)

Three Past Presidents Elected Honorary Members



J. A. CAPP



G. W. THOMPSON



G. H. CLAMER

THIS WEEK ON THE ASSEMBLY LINE



... Peace and quiet once more rules in Michigan labor circles as UAW cleans house.

o o o

... Changes in union personnel followed by cessation of wildcat strikes.

o o o

... Production reaches highest ground of June—General Motors output to continue high.

o o o

... Automobile companies plan further expansion; Ford may add another blast furnace.

DETROIT, July 6.—A strange mantle of peaceful quietness cloaked the automobile industry this week as the UAW took steps to rehabilitate itself in the public eye and in the eye of the automobile companies.

The absence of wildcat strikes led more than one commentator to surmise that perhaps the union knew more about the "unauthorized" strikes than it had previously given indication. The harmony in the working ranks came while conferences on contract revision with General Motors were delayed until the union could make assurance that further contractual obligations would be obeyed. The fact that impromptu sitdowns suddenly ceased led to a quiet wondering along the automobile front whether they could have been stopped much sooner.

Certainly the time had come when a stop had to be called, for the union had already lost a large amount of the ground it had traveled. The projected discussions on revisions of the G. M. peace pact of Feb. 11 had suddenly been postponed. The explanation appeared to be found in a statement by President William S. Knudsen of General Motors. The new G. M. president indicated the corporation had required effective assurance against wildcat strikes, with definite penalties for instigators, before negotiations commenced. This stand was based on clause five of the agreement, which declares that no stoppages of work shall take place until all efforts at mediation of differences have been exhausted, and in no case without the approval of the international officers of the union.

This stand caught the union between the devil and the deep blue sea. It was suddenly placed in a position of being castigated still further in the court of public opinion by admitting its powerlessness—or of taking disciplinary measures which made most precarious its balance of harmony within the organization.

The executive board chose the latter course. In what must have been a bitter behind-the-scenes battle, a series of sweeping changes in executive personnel was ordered. The chief center of the changes was at Flint—and in demanding these changes President Homer Martin may have laid the groundwork for his ouster at the union's convention at Milwaukee next month at the hands of the left wing element.

Three organizers, led by Roy Reuther, were transferred out of Flint. More significant, however, was the demotion of chief organizer Robert C. Travis of the Flint area. Travis was put on an equal plane with four other organizers being assigned at once to Flint, instead of being supreme in that section.

Travis protested immediately, saying that CIO director John Brophy had recommended the Flint status quo be preserved. In his protest Travis was backed up by vice-president Wyndham Mortimer at Detroit, who indicated that he agreed with Brophy.

Inside political circles in the union say Mortimer will be a sure candidate of the left wingers for the union presidency at Milwaukee. Apparently the switch at Flint will result in Travis's backing Mortimer—and Travis is believed to



have control of the bloc of votes belonging to the Flint local.

Into this turbulent political situation another outside voice was injected this week when the AFL organizer, Francis Dillon, said there would be action on the convention floor next month to return the UAW from the CIO to the AFL. Dillon, it will be remembered, was the "conservative" president of the UAW who was ousted by the Lewis-Martin group of then-radicals a year ago last April, at the time the UAW lined up definitely with the CIO.

This engrossing backing and filling within labor circles was by far the most interesting development of the week on the automotive front. In significance, of course, it is highly important.

As regards the immediate outlook, it is likely to pave the way for the projected series of conferences with G. M. on pact revision. These conferences, however, may be subject to still further delay. The corporation is understood to be pressing for the power to discharge provokers of unauthorized strikes without consultation with the union. Thus far the union has denied this apparently well justified demand, saying it would give prejudiced foremen and plant managers the opportunity to vent their dislikes on innocent workers.

Production Gains

The outward quietness of the situation made it possible this week for the industry to go into the highest ground productively for all of June. Ward's Automotive Reports estimated that 122,890 units had been completed in the United

States and Canada, a gain of 1858 over the previous week's level of 121,032, and well above last year's comparative figure of 102,833 cars and trucks.

The higher mark was made possible by Chevrolet, which completed a virtual 100 per cent productive week based on present hourly schedules. This G. M. division advanced about 4000 jobs over its total of the previous week, when after-effects of wildcat strikes were still evident. Much of the Chevrolet advance was counterbalanced by declines at Ford and other plants where the first definite evidences of seasonal contractions are being felt.

Productively, the outlook from hereon is for further shrinkage until new model output begins to hum. Ford is reported ready to close down assembly lines on July 10 through the remainder of the

month. Packard is about set to shut down for model changes, and advices from Kenosha say that Nash is in a similar position.

The bulwarks of the production in the next few weeks are the divisions of General Motors and Chrysler, both of which fell well behind their requirements during the spring strikes. The order banks on file with some of these divisions are amazing, in certain instances, for this time of year. The size of the backlogs gives promise that such producers as Buick, DeSoto, Plymouth, Olds and Pontiac may operate well into August without serious diminishment of their efforts.

Copeland Plant Shuts Down

Back into the ramifications of the labor situation, another large Detroit concern whose business is of interest to steel men reported its

REGISTRATIONS
of the big three
1937 production
models (U. S. pas-
senger cars only)

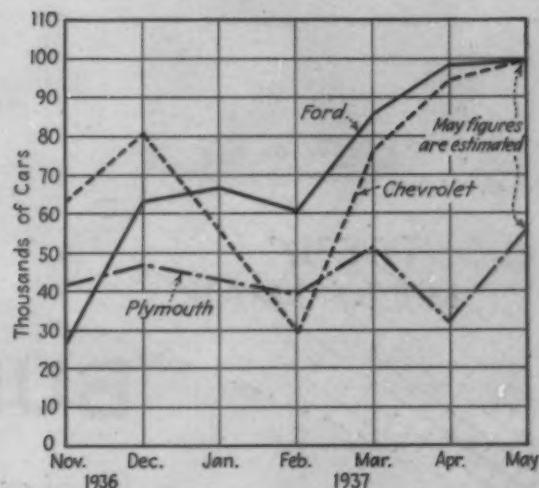


FIGURE YOUR INCREASED PROFITS IN TERMS OF THE MULT-AU-MATIC METHOD



TYPE "J-7"
MULT-AU-MATIC

INCREASE in Profits today is logically acquired through mechanical Savings.

Better mechanical Methods of Production are becoming increasingly important. Equipment of Proved Ability is the Profitable Investment. It is the practical answer to the Newer Economic Problems.

Therefore, the Mult-Au-Matics having been Proved and Accepted as Profit Makers, it but remains for you to Figure Your Increased Profits in terms of the Mult-Au-Matic Method.

If others can Profit, so can you.

Ask Bullard Engineers to Figure Type "J-7" and "J-11" Mult-Au-Matic Profits when applied to your work.

The
BULLARD COMPANY
Bridgeport, Connecticut.

closing this week because of laboritis. This firm was the Copeland Refrigeration Corp., which has been enjoying a remarkable business this spring. Copeland's president, Dallas Winslow, said that demands of the MESA had reached a point where further operations could no longer be carried on successfully. The union denied the charges, saying it had made no new demands since a Copeland strike was settled late in the spring. The plant will remain closed indefinitely; operations may be transferred to another city.

Plans for strengthening labor's grasp on Michigan politics received a setback this week when an AFL unit pulled out of an agreement with the CIO to sponsor a city labor ticket in Detroit's elections next fall. The Building Trades Council, in announcing its action, said it was "definitely opposed" to the CIO.

Legislature Passes Labor Act

At Lansing, the adjoining Legislature passed the Michigan Industrial Relations Act, and thereby took steps to put to a legal end the wave of sitdown strikes. The measure was immediately condemned by labor leaders as an "anti-labor" measure.

While making no references to sitdowns by name, the bill outlaws "patrolling or attendance by any persons at or near a place of business where such persons may be in such manner or numbers as to obstruct or otherwise interfere with approach thereto or egress therefrom." Persons not employed in the place of business cannot patrol or picket "in or about any premises or place of business involved in a labor dispute." Other restrictions are placed on picketing, which must be "peaceful" before it is legal. Mediation becomes voluntary before the Michigan Labor Board. One provision makes possible judicial review and reopened hearings.

The final draft of the bill has no mention of the "extraordinary powers" originally asked by the Governor, nor does it define "unfair practices."

More New Buildings Planned

New construction came unobtrusively into this week's news. Pontiac announced it was adding about 60,000 sq. ft. of floor space to its Pontiac plants in three separate buildings. One will be an addition to the foundry, to be used mainly for core storage. The addition will connect the two present foundry units. It will be 230 ft. long, 88 ft. wide and 34 ft. high. It will allow

for greater flexibility in foundry operations by providing a place for core and mold storage. This year the foundry has been taxed to the utmost to keep up with Pontiac's active assembly lines, and the new addition will allow a bank to be built up against future needs during slack periods.

At Saginaw, the General Motors malleable iron division is taking steps to eliminate its night shift. A new building 100 by 520 ft. will be built in order that all operations may be carried on in the daytime. No addition to the present force of about 1600 employees will be necessitated by the enlargement.

Ford is said to be ready to increase its iron and steel capacity. Another blast furnace stack is said to be planned. The proposed new stack may be larger than either of the present two, which have capacity of around 750 tons daily.

A new home appliance company entered the field this week, bearing the name of a well established automotive company. It is Bendix Home Appliances, Inc., affiliated with Bendix Aviation Corp., with headquarters at Detroit and manufacturing operations in the Bendix shops at South Bend. The first product to be announced—and announcement is scheduled for late this summer—will be a fully auto-

matic washing machine, to be called a "home laundry." Vincent Bendix is active in the affairs of the new company, whose executive personnel includes several other names well known in the auto and home appliance worlds.

Chicago Motor Coach Co., Chicago has placed an order totaling over \$1,000,000 with General Motors Truck Co., Pontiac, Mich. for additional rear-engined Monodrive transmission buses. Delivery of the new units is scheduled for about October 1 and will bring expenditures of Chicago Motor Coach Co. for new equipment to over \$4,000,000 in about two years. Included in the new order are 40 double-deck buses and 30 new single deckers with a seating capacity of 41 passengers. Increases in passenger traffic resulting from the purchase of this new type of equipment continue. During the first quarter of 1937 34 per cent more passengers were carried than in the same quarter in 1936. About 70 per cent of the total May mileage of Chicago Motor Coach lines was handled with the new equipment. When the new units are delivered, 80 per cent of Chicago's bus mileage will be operated with new rear-engined vehicles.



WELD and solder play a big part in body building. Despite the many semi-automatic welding machines used in automotive production (The Iron Age, May 27) the demand for skilled welders continues. These Fisher bodies are shown on the line while a crew gas welds interior bracing.

Awards Are Made For Three Most Beautiful Bridges Built in the United States in 1936

THE American Institute of Steel Construction has selected the three bridges shown on this page to receive stainless steel plaques designating them as the most beautiful structures of their respective types built in the United States during 1936. The jury of awards con-

sisted of two well known architects, Harvey Wiley Corbett and Leonard Schultze, both of New York; two consulting engineers, Clarence W. Hudson and Robert Ridgway, also of New York, and A. Lawrence Kocher, editor of *Architectural Record*, New York. In addition

to the three prize-winning bridges, three others were selected for honorable mention, these being the Henry Hudson bridge, New York; the West Bay crossing of the San Francisco-Oakland bridge, and the Fore River bridge in Massachusetts.



FIRST prize for a bridge of monumental size went to the East River crossing of the Triborough bridge, New York, fabricated by the American Bridge Co. and the American Locomotive Co., erected by the Triborough Bridge Authority, O. H. Ammann, chief engineer. Cost was \$8,500,000.



IN the medium-size class, the hurricane deck bridge across Savage Arm of the Lake of the Ozarks in Missouri, was selected. It was fabricated by the Stupp Brothers Bridge & Iron Co. and erected by the Wisconsin Bridge & Iron Co. Built by Camden County, Missouri, at a cost of \$656,204, it was designed by Sverdrup & Parcel, engineers.



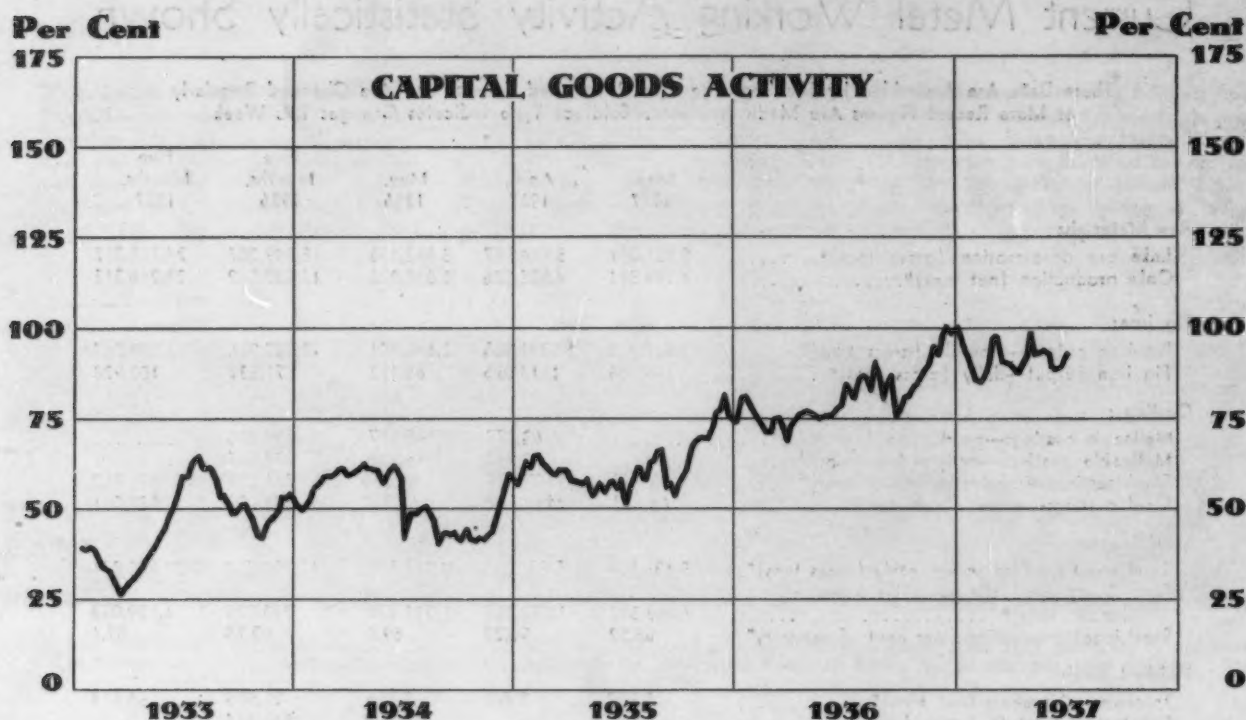
IN the third class, consisting of small bridges, the one over Astoria Boulevard, a part of the Grant Central Parkway extension on Long Island, was given first place. It was built at a cost of \$114,000 by the Long Island State Park Commission and Triborough Bridge Authority and fabricated by the American Bridge Co.

Current Metal Working Activity Statistically Shown

These Data Are Assembled by The Iron Age from Recognized Sources and Are Changed Regularly as More Recent Figures Are Made Available. Boldface Type Indicates Changes This Week

	May, 1937	April, 1937	May, 1936	Five Months, 1936	Five Months, 1937
Raw Materials:					
Lake ore consumption (gross tons) ^a	5,321,011	5,114,117	3,882,173	15,849,207	24,715,312
Coke production (net tons) ^b	4,798,511	4,655,226	3,838,923	17,507,589	23,216,313
Pig iron:					
Pig iron output—monthly (gross tons) ^c	3,537,231	3,391,665	2,648,401	10,887,986	16,599,087
Pig iron output—daily (gross tons) ^c	114,104	113,055	85,432	71,631	109,928
Castings:					
Malleable castings—production (net tons) ^d ...		63,377	45,027	230,326	
Malleable castings—orders (net tons) ^d		62,940	44,136	222,207	
Steel castings—production (net tons) ^d	95,995	105,475	64,246	271,259	495,322
Steel castings—orders (net tons) ^d	68,688	109,672	63,950	329,199	537,091
Steel Ingots:					
Steel ingot production—monthly (gross tons) ^e ...	5,135,559	5,071,875	4,037,375	17,300,528	24,580,871
Steel ingot production—weekly average (gross tons) ^e	1,163,332	1,182,255	911,371	796,525	1,139,058
Steel ingot production—per cent of capacity ^e ...	88.82	90.27	69.6	60.78	87.1
Finished steel:					
Trackwork shipments (net tons) ^f	8,807	9,888	7,314	28,085	44,814
Sheet steel sales (net tons) ^g			191,511	946,647	
Sheet steel production (net tons) ^g			224,056	1,064,210	
Fabricated shape orders (net tons) ^h	118,842	148,152	145,553	629,589	728,831
Fabricated shape shipments (net tons) ^h	130,714	136,042	134,623	537,774	611,881
Fabricated plate orders (net tons) ^h	28,545	42,455	51,443	178,470	216,044
U. S. Steel Corp. shipments (tons) ^h	1,304,039	1,343,644	984,097	4,145,285	6,345,724
Ohio River steel shipments (net tons) ⁱ	102,200	101,720	86,004	356,166	510,590
Fabricated Products:					
Automobile production, U. S. and Canada ^k ...	540,357	553,415	480,571	2,125,422	2,396,081
Construction contracts, 37 Eastern States ^l	\$244,112,800	\$270,125,200	\$216,070,700	\$1,004,676,100	\$1,176,377,200
Steel barrel shipments (number) ^m	786,607	970,749	730,784	3,194,647	4,393,791
Steel furniture shipments (dollars) ⁿ	\$2,258,814	\$2,462,687	\$1,451,199	\$7,741,223	\$11,483,169
Steel boiler orders (sq. ft.) ^o	1,005,591	674,248	723,343	3,530,731	4,701,856
Locomotive orders (number) ^p	14	84	10	98	206
Freight car orders (number) ^p	3,903	13,046	9,677	22,234	44,562
Machine tool index ^q	208.5	282.5	118.9	116.6	1234.2
Foundry equipment index ^r	237.6	208.1	165.4	138.1	1248.1
Foreign Trade:					
Total iron and steel imports (gross tons) ^s		68,197	59,391	259,235	
Imports of pig iron (gross tons) ^s		11,469	15,296	80,714	
Imports of all rolled steel (gross tons) ^s		39,239	20,994	108,053	
Total iron and steel exports (gross tons) ^s		671,746	314,950	1,336,640	
Exports of all rolled steel (gross tons) ^s		197,327	93,686	432,927	
Exports of finished steel (gross tons) ^s		174,143	86,346	399,780	
Exports of scrap (gross tons) ^s		421,383	217,439	885,762	
British Production					
British pig iron production (gross tons) ^t	696,300	680,700	661,000	3,105,000	3,311,700
British steel ingot production (gross tons) ^t	1,047,300	1,080,400	963,000	4,778,300	5,232,000
Non-ferrous Metals:					
Lead production (net tons) ^u		43,908	41,551	185,197	
Lead shipments (net tons) ^u		55,200	33,125	178,001	
Zinc production (net tons) ^v	55,012	52,099	44,905	208,785	230,064
Zinc shipments (net tons) ^v	55,201	56,229	43,977	210,833	269,245
Deliveries of tin (gross tons) ^w	6,425	6,995	5,235	29,225	37,890
Copper production, refined (net tons) ^x	95,265	83,178	59,374	748,660	401,449

* Preliminary. † Three months' average. ‡ Revised.
Source of figures: ^a Lake Superior Iron Ore Association; ^b Bureau of Mines; ^c The Iron Age; ^d Bureau of the Census; ^e American Iron and Steel Institute; ^f National Association of Flat-Rolled Steel Manufacturers; ^g American Institute of Steel Construction; ^h United States Steel Corp.; ⁱ United States Engineer, Pittsburgh; ^j When preliminary from Automobile Manufacturers Association—Final figures from Bureau of Census; ^k F. W. Dodge Corp.; ^l Railway Age; ^m National Machine Tool Builders Association; ⁿ Foundry Equipment Manufacturers Association; ^o Department of Commerce; ^p British Iron and Steel Federation; ^q American Bureau of Metal Statistics; ^r American Zinc Institute, Inc.; ^s New York Commodities Exchange; ^t Copper Institute.



The Iron Age Weekly Index of Capital Goods Activity
(1925-27 = 100)

Last week	94.1	Same week 1934	41.3
Preceding week	92.0	Same week 1933	59.3
Same week last month	89.0	Same week 1932	35.7
Same week 1936	84.9	Same week 1931	64.8
Same week 1935	50.5	Same week 1930	92.7
Same week 1929	122.3		

ACTIVITY in the production and distribution of durable goods gained two points over the preceding week, bringing the index up to the highest point since May 1. As in the previous week, when a gain of 3.4 points was recorded, the advance was due not so much to gains in individual indices, but to the fact that the usual seasonal declines have yet to be felt. When seasonal correction factors are applied, the net result is an advance. Automobile production rose 1.5 per cent, but may decline from now on. Carloadings of forest products showed a superficial gain, whereas the Pittsburgh indices remained unchanged in the composite. The advance in ingot output for the week ended July 3 as a result of struck mills reopening became even more

pronounced when the seasonal factor was applied. And although heavy engineering construction awards fell 52 per cent from the preceding week, a gain is noted in the 13-week moving average used in THE IRON AGE calculations. The actual figure is still 48 per cent above the corresponding figure for 1936, however.

	Latest Week	Change from Preceding Week
Steel production (per cent of capacity)	76.5	+1.5
Automobile production (number of cars and trucks)	122,890	+1,858
Railroad loadings of forest products (number of cars) ..	39,753	+282
Pittsburgh industrial production and shipments (index number)	104.8	-0.1
Construction contracts awarded (total value)	\$55,478,000	-\$60,052,000

Components of The Index (1) Steel Ingot Production Rate, from THE IRON AGE; (2) Automobile Production, from Ward's Automotive Reports; (3) Revenue Freight Carloadings of Forest Products, from Association of American Railroads; (4) Industrial Productive Activity in Pittsburgh District, from Bureau of Business Research of University of Pittsburgh; (5) Heavy Construction Contract Awards, from Engineering News-Record.

Perfection in finished Steel



A single Push Button Controls
Rolls to PRESET Drafts on
100 inch Homestead Plate Mill

It's a Fast Method...and it's accurate

• Finished Steel of high quality—hard, smooth, blue-surfaced plates—reduced during rolling operations under finger-tip control. Proper roll drafts, that permit fast operation and maintain quality, are preset. The button is pressed and the desired reduction per pass is secured automatically.

• Total rolling time is short. Only 90 seconds are required from the time that the slab comes out of the furnace until it leaves the last finishing stand in finished plate form. *It's accurate, too.* One piece, checked after the last automatic pass through the roughing mill, measured within two thousandths of an inch of the setting on the draft-selector panel.

• The EC&M Automatic PRESET Screwdown Control, applicable to Blooming, Slabbing and Plate Mills, permits as many rolling schedules and passes as desired. *There's no time lost in changing schedules.* Press a button—one schedule is disconnected and another connected in—and the mill is ready for rolling the new piece. Investigate this advanced and modern system of screwdown control to-day. Full details upon request.

At right is shown entry side of the reversing, roughing mill and the operator's pulpit. Adjustment of the vertical rolls and front and back side guides are also secured automatically from the single push button which controls the horizontal roll movements.



The Automatic System requires only 5 additional leads to the mill stand; remaining automatic equipment mounted in central room or operator's pulpit.

EC&M Automatic Pre-Set Screwdown Control

WASHINGTON



... Steel situation provokes critical comments on President, Secretary Perkins and John Lewis in both Senate and House.

.

... Report of Federal Steel Mediation Board formally closes Government's efforts to settle steel strike—Miss Perkins has no new plan.

.

... Federal Trade Commission branches out in its fight against basing point system by bringing suit against cement industry.

By L. W. MOFFETT

*Resident Washington Editor,
The Iron Age*

.

WASHINGTON, July 6.—Steel has exploded all over Washington. It has cascaded hotly over the White House, the Capitol, Jim Farley's luxurious Post Office Department, Madam Perkins', sumptuous Department of Labor, the cramped abode of the National Labor Relations Board and the ornate headquarters of CIO Grand Commander John L. Lewis. It set off such scorching debate in the House that the Speaker hurriedly forced adjournment. Ordinarily steel is a great big toy which the politician loves to play with. That of course is being done today on a grand scale, but the peak seems to have passed at least temporarily. The reason for letting up on the tempo is that the reckless playboys were getting burned. The labor situation fired detonating explosives which shot hot fragments in the faces of those who started the firing, and others who tried to keep out of firing range. From steel may stem fundamental history making political issues—whether an organized minority pressure group shall replace the majority in control of the Government.

At the White House, which anxiously attempted to avoid getting into the picture publicly, whatever were its activities behind the scenes, the President did some more or less fancy fencing in personally going on record in the steel strike situation. However, despite his obliga-

tion to the CIO cause, as Lewis has brusquely put it, the President did, in referring to the steel strike situation, turn to a thrice-uttered phrase of the regretful and dying Mercutio, "A plague o' both your houses," as indicating that he can no longer back CIO in its turbulent activities. He hedged somewhat in saying he and Chairman Charles P. Taft of the Federal Steel Mediation Board agreed that the Shakespearean expression represented the feeling of the nation as a whole. He did not say that it reflected his own feeling, but the very fact that the phrase occurred to him indicated that it accorded with his own state of mind. A subsequent interpretation by a White House official partially confirmed the assumption. For, it was pointed out, the President "means houses of extremists on both sides—those who want violence on one hand and those who will not negotiate on the other." Of course the President from the outset indicated a feeling of plague on steel companies which by implication he had criticized for not signing agreements—agreements with those who promote violence and disregard contracts. Hence, since steel companies were already in the Presidential doghouse, the plague naturally and for the first time must have been extended, even though lightly, to Lewis's CIO—much more lightly than it was branded on Lewis and his uncon-

trollable CIO in damning terms in Congress by New Deal adherents, unable longer to stomach CIO lawlessness. A swallow does not make a summer and a mild, abstract and natural condemnation by the President of violence may not mean a break with Lewis. But it has its possibilities along with possibilities of legislation fixing labor responsibility.

Roosevelt Criticized

At the Capitol the steel situation developed bristling attacks by both Democrats and Republicans on the President and Madam Perkins for taking the side of the steel strikers and also on Lewis and his CIO. Senator Ellender, Democrat of Louisiana, said the President had acted unwisely in the steel strike situation. He declared that by "intimating the steel owners should have signed a contract and should have kept their mills closed until the strike was settled," the President had held out hope to the strikers and caused them to prolong the strike. While criticizing both sides in the strike for being "stubborn," Ellender said, however, that Secretary of Labor Perkins "in her zeal to settle the strike, has sided with strikers and not within the letter of the law." His address followed a statement in the House by Representative Ditter, Republican of Pennsylvania, that the country had a right to expect a positive declara-

GET A BETTER PRODUCT AT LESS COST *on Heald Bore-Matics*

GREATER ACCURACY
BETTER FINISH
MORE PRODUCTION
LOWER COSTS

SCRAP AND
SLOW, COSTLY
OPERATIONS

PROGRESSIVE plants, including the largest of valve manufacturers, have eliminated slow, costly reaming and lapping operations at one stroke by installing Heald Bore-Matics for precision finishing, using single point diamond or tungsten carbide tools.

Results have definitely proven that these machines can finish such work at considerably lower costs with negligible tool upkeep, greater production and to higher standards of quality than can be produced by any other methods.

Whether you make valves or any other product where precision is required, it is to your interest to investigate Heald Bore-Matics. Get in touch with our nearest branch office or factory at Worcester.

Illustration shows a Heald No. 48A Bore-Matic, precision turning and boring mating valve plugs and bodies simultaneously.



THE HEALD MACHINE CO., WORCESTER, MASS., U. S. A.

tion from the President to "end this reign of terror" in steel areas. Representative Cox, Democrat of Georgia, warned "John L. Lewis and his communistic cohorts here and now that no second 'carpetbag' expedition in the southland under the red banner of Soviet Russia, and concealed under the slogans of the Committee for Industrial Organization will be tolerated."

House Battle Waxed Hot

So hot did words and gestures become over the discussion last Friday in the House that Speaker Bankhead suddenly declared adjournment, fearing or affecting to fear fisticuffs between Representative Cox and Representative Maverick of Texas. The latter, a CIO zealot, had taken sharp exception to Cox's castigation of Lewis and his CIO. Fiery argument between the two ensued and each, white with anger, engaged in a verbal lashing of the other and began making demonstrations that threatened a man-to-man row—or so it appeared. Speaker Bankhead quickly rapped the House to adjournment. Ten thousand copies of a rabble-rousing speech made by Maverick, the "peepul's" friend, before the Automobile

Workers Union in Detroit on June 5, are being mailed by the CIO to Ford workers under franked envelopes supplied by Maverick—at the cost of the "peepul" whom he so cherishes. The more or less modest Maverick, ever eager to advertise his own brand of petty politics, had his Detroit speech printed in the Congressional Record, well known depository for a great deal of other literary trash as well as some real political philosophy.

Members of Congress from different sections likewise fell upon Lewis with bitter verbal onslaughts as proposals increase for legislation to fix labor responsibility, just as the one-sided Wagner Act fixes industry responsibility. Then at the Capitol, too, Senator LaFollette, enjoying the limelight, staged the south Chicago steel strike riot before his Civil Liberties Committee. Like so many "investigations" common to Washington it smacks of a highly ex parte proceeding designed not only to smear steel companies but to play to elements that have no regard for law and order. This "investigation" was the pièce de résistance for Senator LaFollette from the outset. In retaliation for a resolution by Senator Bridges,

Republican of New Hampshire, for an investigation by the Committee on Post Offices and Post Roads of mail interference by strikers at Republic Steel plants in Ohio, Senator Guffey, Democrat of Pennsylvania, offered a resolution to have the committee investigate alleged steel company activities, including the Chicago riot. Senator Bridges proposed that Postmaster Farley be called before the Post Office Committee and explain why the Post Office Department submitted to SWOC mail censorship. Eager to protect the sacred person of Farley, Senator McKellar, Democrat of Tennessee, chairman of the Post Office Committee, opposed the Bridges resolution. It was voted down. So far as the committee is concerned Farley was whitewashed. But the obliging McKellar readily waived jurisdiction of his committee to inquire into so-called steel company activities and turned the job over to the tender mercies of the LaFollette committee. However, the case against the Post Office Department for permitting striker interference with mails already is conclusive to any fair mind, even if his adherents of Congress won't allow Farley to be buzzed. Besides he has a court

New 6" x 6" PEERLESS Improved HIGH DUTY METAL SAWING MACHINE

Automatically feeds the bar of stock forward to the gauge, automatically closes the vise, and automatically continues to repeat the complete cycle of cutting until the entire bar is cut to the length the gauge is set for, all without the attention of an operator.

The three speed sliding gear transmission—crankshaft—balance lever and trunnion blocks are fully ball bearing equipped.

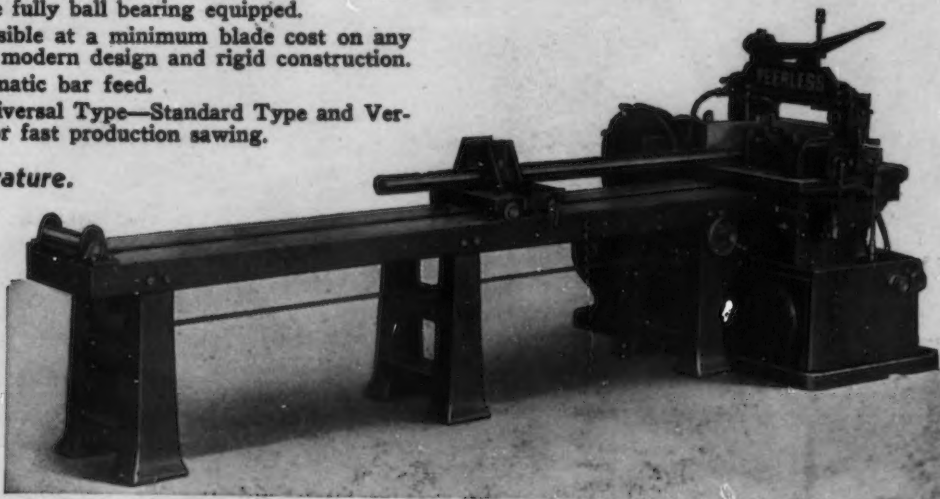
The fastest cutting time possible at a minimum blade cost on any kind of metal because of its modern design and rigid construction. Also furnished without automatic bar feed.

Also—Peerless Improved Universal Type—Standard Type and Vertical Type in various sizes for fast production sawing.

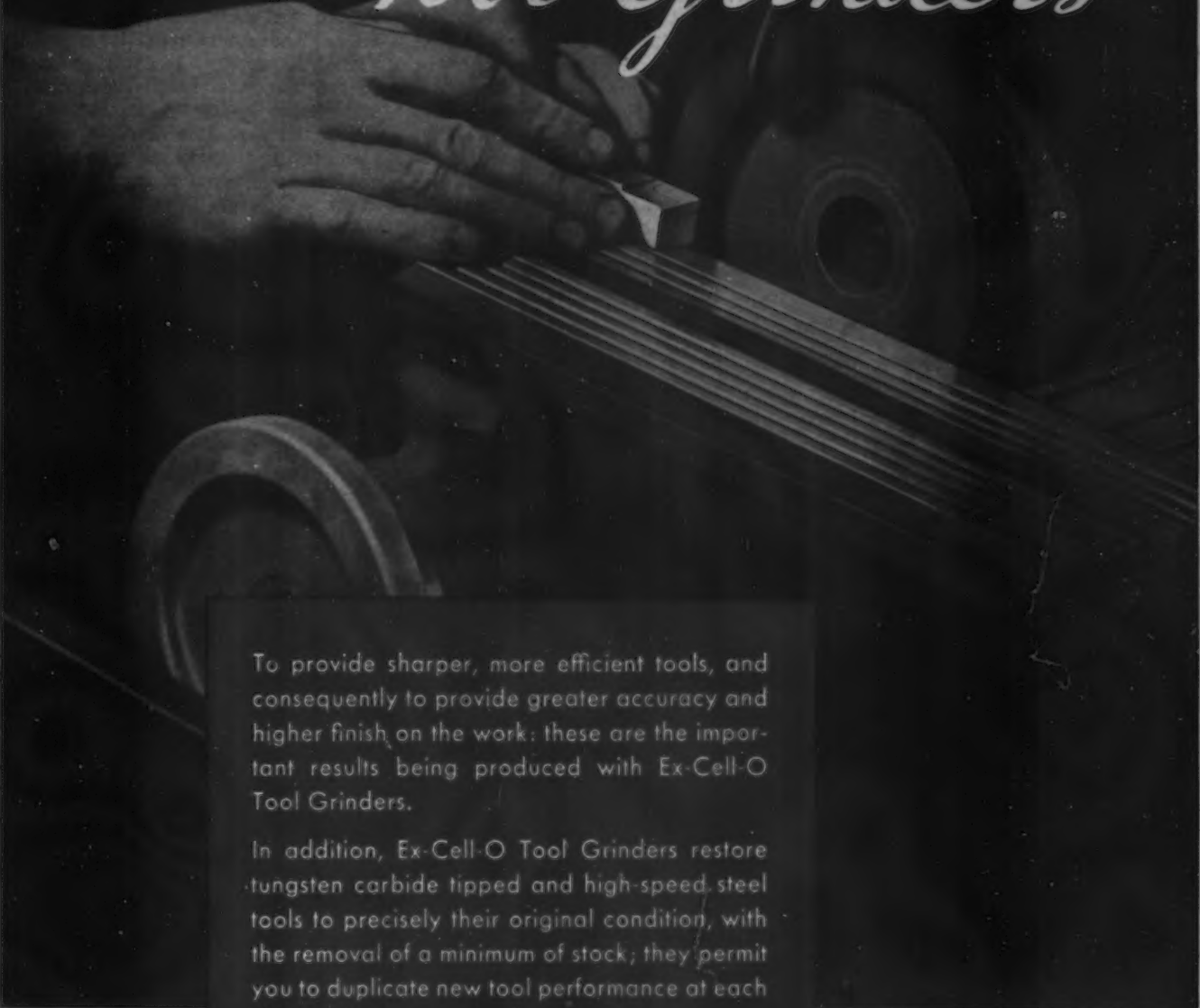
Write for complete literature.

**PEERLESS
MACHINE
COMPANY**
RACINE, WISCONSIN

*with Hydraulically Operated
Automatic Bar Feed*



Ex-Cell-O Carbide Tool Grinders



To provide sharper, more efficient tools, and consequently to provide greater accuracy and higher finish on the work; these are the important results being produced with Ex-Cell-O Tool Grinders.

In addition, Ex-Cell-O Tool Grinders restore tungsten carbide tipped and high-speed steel tools to precisely their original condition, with the removal of a minimum of stock; they permit you to duplicate new tool performance at each sharpening.

Through increased tool efficiency and materially lower sharpening cost, Ex-Cell-O Tool Grinders have proven their ability to pay for themselves. There is a type to meet every carbide and high-speed steel tool grinding requirement. Priced for economy in both large and small railroad shops. Send for your copy of the Ex-Cell-O Railroad Products catalog.



TRADE MARK

EX-CELL-O CORPORATION • DETROIT, MICHIGAN

case pending against him and this provides a much fairer proceeding than is possible at the hands of a biased Congressional committee.

Miss Perkins Has No Plans

Over in the Labor Department Madam Perkins, plainly in a dither over the collapse of the Federal Steel Mediation Board's efforts, and grasping for a straw, announced she has no plans at present for settlement of the strike, but is considering other ideas, which she said she doubted are practical. About the only efforts in mind apparently were the recommendations of the board which already had failed. The report of the board, made public by her, last Thursday, merely summarized its operations, important features of which already had been announced. The board repeated that the only hope for solution of the strike situation lay in a man-to-man discussion around the conference table. The steel companies have refused to confer with what they termed an irresponsible group.

The highly pro-CIO National Labor Relations Board meanwhile, though pretty much shunted aside in the steel strike situation, finds it lends mightily to its headaches, both self-imposed and uninvited. It does revel in its almost exclusive and strange belief that it is a crusading agency for making industrial peace, yet it has its grief, lathered as it is from overwork brought on by numberless requests for complaints, many from SWOC, most of which the board automatically issues. And it now is reluctantly stepping into quarrels between Lewis's CIO and Green's AFL, a step long resisted but long ago was seen to be inevitable sooner or later. It is suspected that Miss Perkins does not mind how much grief the NLRB has to endure. Since she, in her insatiable desire for more power, was unable to have Congress let her adopt it as an appendage of the Department of Labor she has treated it as an unwanted stepchild. Equally as pro-CIO as is the Labor Board, Miss Perkins is always anxious to engage in valiant battle for the Lewis group and if she can take the job from the NLRB she appears to get added pleasure out of her bustling activities. But the steel situation has brought her face to face with the most difficult nut she has yet tried to crack and it is possible she wishes she had not taken on the job.

And what about Lewis, with his flair for dramatic verbosity, since he returned empty-handed from the Cleveland steel negotiations? Not a peep on the subject has come from him. A wag has said that he is shadow boxing with the Sphinx.

Trade Commission Again Opens Drive Against Basing Point

WASHINGTON, June 6.—Not unexpectedly the Federal Trade Commission has broadened its age-old, persistent drive against the basing point system. Not content to rely solely on a test of its effort to compel f.o.b. mill pricing in its present proceeding against cast iron soil pipe producers in the Birmingham-Plus case, involving a single basing point, the commission has again reached out against the multiple basing point system. This time, instead of striking at steel, which

perhaps is a future objective, the complaint is directed against the cement industry, whose system so far as it covers numerous basing points is similar to the system used by the steel and other basic industries. The commission, it is reported, is prepared to apply action in the two cases to all industries using the basing point system, either the single or multiple system, seeking through cease and desist orders to wipe out the practice in one fell swoop. The commission wants basing point systems to be



The ways on the J&L Universal Turret Lathe are hardened and precision ground. They are attached to the bed with vertical and angular cap screws which enter blind tapped holes. These ways are *triple purpose*. They provide uninterrupted bearing surfaces on the top of the ways the full length of the bed, hardened bearing surfaces for the hold-down gibs and all aligning surfaces of the carriage and saddle. The ways are protected with stationary, full length way guards. J&L Turret Lathes are built to *stay* accurate—your assurance of continuous earning power.

"TRIPLE PURPOSE"
Hardened & Ground Ways

replaced by an f.o.b. pricing system.

The complaint against the cement industry is directed at the Cement Institute and 75 cement manufacturing member corporations, producing 95 per cent or more of the cement made in the United States, according to the commission. Like the complaint against the Birmingham-Plus system, that directed against the cement industry alleges violation of the Federal Trade Commission Act and Section 2 (price discrimination) of the Clayton Act as amended by the Robinson-Patman Act. The complaint charges that "the chief means employed for carrying the cement combination into effect is concerted use of the multiple basing point system of quoting prices." It repeats the old

statement that "identical delivered prices are made by every quoting producer entering into combination to any given destination in the United States." Sounding off on the key to its Ickes-inspired report to the President and Department of Justice last year in steel cases, the commission gives instances of identical cement bids to various Federal and State agencies. Because of the indifference of the New Deal to increasing taxes, occasioned by its unparalleled spending extravagance, irony is seen in one contention made by the commission. Citing the alleged effect of the "respondent's combination upon the public interest," the commission says, among other things, it raises the cost of public roads and other projects using cement or raises

"the taxes and rents," by which the public pays for them.

Commission's Allegations

The commission statement alleges the following cooperative methods have been used by cement producers "in support of their combination:"

"They have refused to sell f.o.b. mill and will sell only at formula delivered prices;

"They have employed the institute's freight rate books for the computation of identical delivered prices regardless of whether the rates contained in the books are officially correct or not;

"They have penalized customers where customers use trucks for delivery, but have monopolized for themselves the benefits of cheaper transportation when available by highways and waterways;

"They have prohibited diversion of cement in transit;

"They have resorted to misleading propaganda as to the competitive character of their practices;

"They have deprived branches of the Federal Government buying cement for numerous Western projects of part of the benefit of land grant railroad rates;

"They have arbitrarily divided customers into classes—those who may buy direct and those who may not;

"They have made arbitrary definition of what middlemen shall be regarded as "cement dealers." Others have not been permitted to buy;

"They have made uniform terms and discounts.

"They have at times used boycott and espionage of dealers to eliminate the competition of foreign cement importers."

The system is also alleged to be one of price discrimination since under it the true or net prices received by each producer, from various customers, are substantially different. Customers nearest the mills are obliged to pay higher net prices than are made by a local mill to distant customers.

As to the public interest in support of the case, the following allegations are made:

"The direct and immediate result of the said combination has been and is restraint upon interstate commerce with respect to cement manufactured by any of the producing respondents to be transported beyond the State in which the cement was made. Such confederated action exercises a power which individual action could not exercise or possess, and the necessary tendency and the direct and substantial effect of the combination are injury to the public.

"The effect of the respondents' combination upon the public interest has been and now is:

"(1) To bring about the disappearance of prices arrived at through the



play of competitive forces, and the adoption by concert of organized producers of prices calculated to preserve the more poorly located, equipped, and conducted units at the expense of the buying public;

"(2) To lessen the demand for cement and the volume of public and private construction in which cement is used;

"(3) Correspondingly to lessen the opportunities for employment, both in the cement industry and in the construction industry;

"(4) To raise the cost of public roads and projects and private structures in which cement is used and thereby either to make them less available to the public or to raise the taxes and rents by which the public pays for them;

"(5) To encourage the development of excess capacity by the inducement of high prices and of fictitious freight charges obtainable by mills not located at basing points."

Aircraft Production Gains Substantially

WASHINGTON, July 8.—Aircraft production in the United States in the first quarter of the present year increased 25 per cent over that for the corresponding period in 1936, according to the Bureau of Air Commerce, Department of Commerce. The total of all aircraft manufactured in the first quarter of this year was 571 while that for the corresponding period of last year was 456.

Carboloy Co., Inc., 2995 E. Jefferson Avenue, Detroit, manufacturers of Carboloy cemented carbide tools, dies, and wheel dressers, announces a reduction in the price of its diamond-impregnated wheel dressers.

Steel Mediation Board Report Formally Closes Strike Negotiations

WASHINGTON, July 6.—A seven-page mimeographed report, which concluded with the blunt statement that refusal of the four steel companies to enter into an agreement with the SWOC "is not the way to industrial peace," apparently brought to an end the unsuccessful efforts of the Federal Steel Mediation Board.

Apologetic because no member of the board was on hand to answer questions when the report was made public last Thursday, Labor Secretary Frances Perkins denied any blame was placed on the steel companies for failure at mediation.

"I am sure the board did not intend it that way," she said. Despite this denial, it was clear that Madam Secretary felt the steel representatives had erred in regarding the CIO and the SWOC as "irresponsible." She went out of her way in defending CIO leadership.

Madam Perkins said she had no immediate plans for settlement, but that other ideas were being considered. She expressed doubt, however, that these "other ideas" would prove "practicable." There was little doubt in the minds of most observers that the ill-fated attempt at mediation, doubtful of success from the start, ends with the submission of the report.

The Mediation Board's report included a day by day account of the activities covering its alternate meetings with labor and employer representatives and revealed that Tom Girdler, Republic Steel board chairman, in addition to his charge of CIO "irresponsibility," objected

to a term contract with the union on the ground that his company would then be prevented from meeting fluctuation in prices of steel by wage variations if they became necessary.

"We cannot but believe," the report said, "that the bitterness and suspicion which separate the two sides would be allayed by a man-to-man discussion around the conference table between the heads of the four companies and the union representatives, and that the only present possible hope of settlement lies in such a hearing."

Madam Secretary, whose name made the headlines recently when Governor Davey of Ohio reported she had suggested the "kidnaping" of two steel executives in an effort to force a settlement of the steel controversy, said at her press conference that she believed the bringing together of employers and employees "through legal process" would bring labor controversies like the present one to a speedy solution.

She said she concurred in the view of the Mediation Board that had steel representatives and union spokesmen met face to face the results would have been different.

Meanwhile Miss Perkins was being assailed in both houses of Congress for her pro-labor stand. Representative Ditter, Republican, of Pennsylvania, charged she had given "aggressive encouragement" to unions "perpetrating outrages," and Senator Ellender, Democrat, of Louisiana, had this to say:

"In her zeal to settle the strike, Miss Perkins has sided with the strikers and most assuredly not in compliance with the law."

SAFETY

Pat. Re-17846 Others Pending

WEDGE HOLDERS

WITH THREE OUTSTANDING FEATURES

SAFETY - EFFICIENCY - DURABILITY

These new style type holders are 25% lighter and 50% stronger. The wedge design permits deeper marking with less exertion on the part of the operator. They will not mushroom or spall as they are made of SAFETY STEEL. The type can be released by the pressure of a finger on the new safety snap slide holding the locking pin.



SLEDGE MODEL



HAND MODEL



AXE MODEL

M. E. CUNNINGHAM CO.

101 E. CARSON ST.
PITTSBURGH, PA.

Ludlum Issues Practical Alloy Steel Handbook

UNDER the title "Fine Steels by Ludlum," Ludlum Steel Co., Watervliet, N. Y., has recently published an attractive, pocket size handbook of 150 pages which is obtainable without charge by readers of THE IRON AGE.

In addition to containing many new charts, conversion tables and other useful facts for the steel user, there is included a "Steel Finder" showing how to select the correct steel for a particular job, also a "Stainless Finder" which indicates the comparative resistance of each grade of stainless to the various corrosive agents.

Specific data are included covering the proper methods employed for welding, annealing and hardening the various compositions. Other data, gathered by means of physical tests and practical experience cover nitralloy and special products such as hollow drill steel, magnet steel, welding rods for hard surfacing, etc.

Reference tables are given covering weights, gages, hardness, cutting speeds, temperature conversions and grain size standards.

Castings Improved By New Graphitizer

TO facilitate production of iron castings of greater uniformity and improved machinability the Electro Metallurgical Co., 30 East Forty-second Street, New York, is offering a new graphitizing compound designated as the Electro-melt Special Graphitizer. This compound, which acts both as a de-oxidizer and a graphitizer, is said to be particularly useful in con-

trolling the tendency of castings to chill in light sections and at corners.

Use of as little as 2 to 8 oz. of the material to each 100 lb. of cast iron will reduce the depth of chill, soften light sections, and improve machinability, such additions also refining the graphite in heavy sections and thus improving the strength and uniformity of the iron. The compound is further said to promote the formation of normal flake graphite and tends to eliminate "eutectic" graphite areas.

New Soluble Cutting Oil

THE National Oil Products Co., Harrison, N. J., is offering a new soluble cutting oil for use with high-speed machine tools operating under heavy feeds. Named NOPCO 1227-B, this oil cools as well as lubricates. It is a combination of mineral and fatty oils treated in such a way as to be immediately soluble in cold or warm water. The fatty oil content is said to be high as compared with most soluble mineral oils.

Labor Bargaining Discussed in Book

AN effort to approach collective bargaining in an objective manner in order to more fully understand the problems underlying this subject is made by R. D. Bundy, industrial coordinator, Board of Education, Cleveland, in his new book, "Collective Bargaining." Published by the National Foremen's Institute, New York, the book discusses the history of bargaining and the various phases of dealing with labor organizations. The book has 43 pages, is cloth bound, and costs \$1.

High Temperature Refractory Improved

FURTHER improvement is said to have been made in the refractoriness and working quality of Harwaco Bond, a high temperature bonding mortar recommended for use in industrial furnace masonry.

The improved product has a pyrometric cone equivalent of cone 32 (3092 deg. F.). Use of this diaspore-base bonding mortar in place of mortar consisting essentially of fire-clay is said to be increasing for laying fire-clay, super-duty fire-clay, and high-alumina brick where a strong bond must be maintained at the upper limits of industrial furnace operating temperatures. The improvement in the product is the result of several years of research by the Harbison-Walker Refractories Co., Pittsburgh.

Health Protection Of Welders

COMPILATION of present-day information on health hazards connected with welding operations has been made by the industrial health section of the Metropolitan Life Insurance Co., in a booklet on "Health Protection of Welders." This report discusses the types of welding and lists four principal hazards encountered: (1) Electric shock and burns; (2) radiant energy (roughly classified as ultra-violet rays, infra-red rays and visible light rays of excessive intensity); (3) gases, fumes and dust, and (4) miscellaneous, which includes such hazards as the possible exhaustion of oxygen in the air breathed due to pollution by products of combustion in confined, unventilated spaces. Methods of treatment are also considered. Copies of the booklet may be obtained from the Policyholders Service Bureau of the company, 1 Madison Avenue, New York.



THE new plant of the Monarch Machine Tool Co. at Sidney, Ohio. An addition of 18,000 sq. ft. gives a total of 100,000 sq. ft. of manufacturing space.

A.S.T.M. Meeting Held in New York

(CONTINUED FROM PAGE 49)

years. He has been associated with the Hunt company since 1904, and has been active in A.S.T.M. affairs as chairman of Committee A-1 on steel since 1932.

Members of the executive com-

mittee elected for two years include the following: P. H. Bates, chief, clay and silicate products division, National Bureau of Standards, Washington; H. F. Clemmer, engineer of materials, District of

Columbia; G. E. F. Lundell, assistant chief, chemistry division, National Bureau of Standards, Washington; H. C. Mougey, chief chemist and assistant technical director research laboratories division, General Motors Corp., Detroit; and R. L. Templin, chief engineer of tests, Aluminum Co. of America, New Kensington, Pa.

Three Honorary Memberships Awarded

In recognition of their eminence in the field of engineering materials and their service to the A.S.T.M., three of the society's past presidents were awarded honorary memberships. The men so distinguished were: John A. Capp, engineer of materials, General Electric Co. who spent his entire engineering life with the company since graduating from the University of Pennsylvania in 1892; Guillian H. Clamer, president and general manager, Ajax Metal Co., with which he has been associated since 1897, and also president of the Ajax Electric Furnace Corp.; and Gustave W. Thompson, chief chemist and director, National Lead Co., who is an international authority on lead and its uses. All three men have been members of the Society for over 35 years.

Dudley Medal to Authors of Paper on Bridge Failure

W. H. Swanger, chief, section of mechanical metallurgy, and G. F. Wohlgemuth, associate metallurgist, respectively, National Bureau of Standards, were awarded the Charles B. Dudley Medal for 1937. This medal is presented to the author or authors of the paper presented at the preceding annual meeting which is of outstanding merit and constitutes an original contribution on research in engineering materials. The winning paper entitled "Failure of Heat-Treated Steel Wire in Cables of the Mt. Hope, R. I., Suspension Bridge" described the extensive work undertaken at the National Bureau of Standards to determine the causes of the failure.

Mr. Swanger is a graduate of Pennsylvania State College. After a short period of employment in the research department of the New Jersey Zinc Co., he entered military service from August, 1917, to September, 1919. He then was re-employed with the New Jersey Zinc Co. until January, 1921, when he became affiliated with the National Bureau of Standards in the chemistry division. In 1927 he was transferred to the division of metallurgy. In addition to his membership in A.S.T.M., he is chairman

Most Economical In Holes Drilled per Dollar

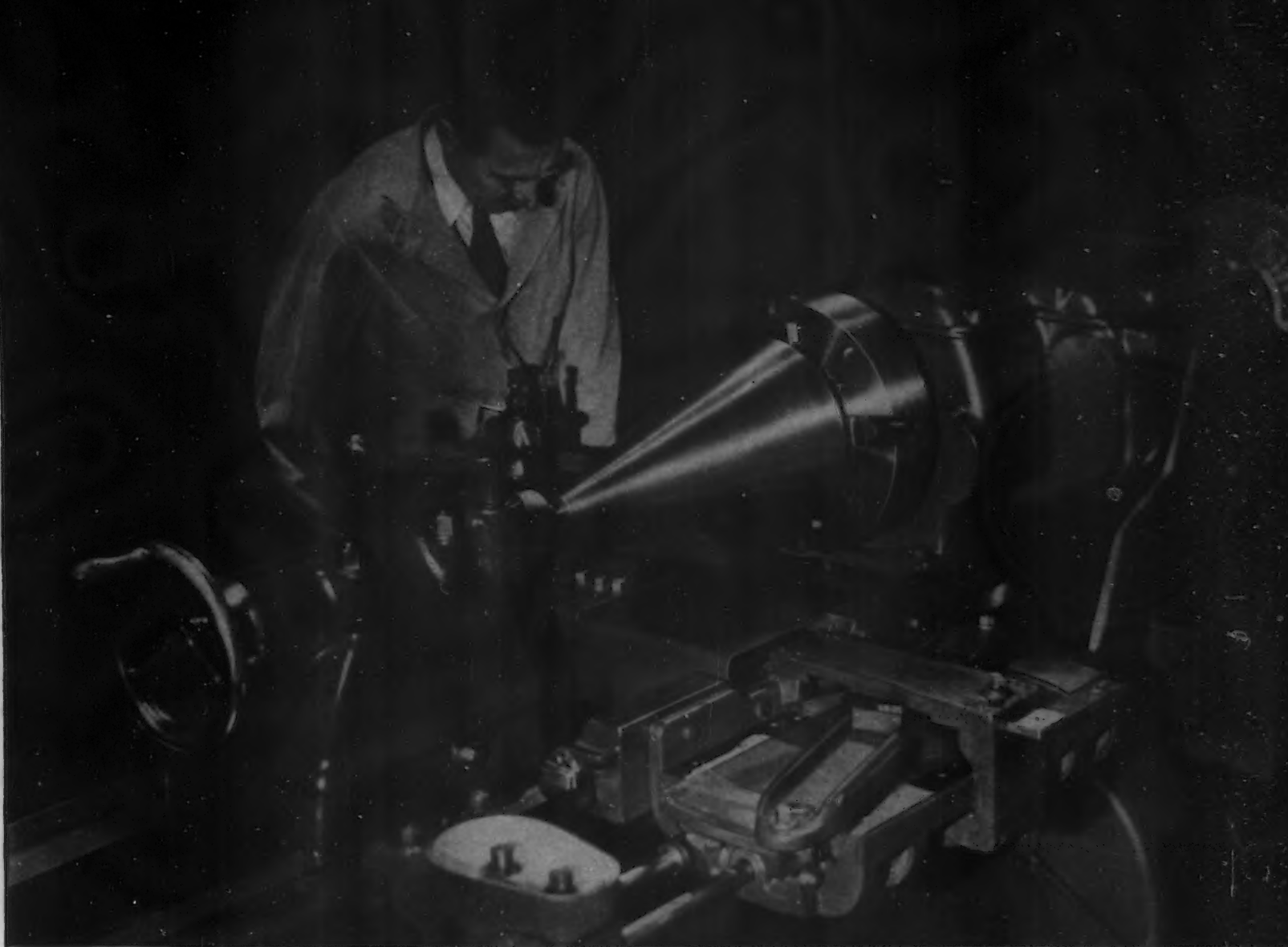


Super Service Uprights are built for those manufacturers who want the best drilling performance obtainable as measured by any practical yardstick. Check against your present equipment and compare and see how much you can save with the convenient single lever control of closely graded speeds and feeds, plus rigidity and power to get the most out of modern cutting tools.

Write for Bulletin U-22

THE CINCINNATI BICKFORD TOOL CO.
OAKLEY CINCINNATI OHIO U.S.A.

*Super
Service*



***IT'S NEVER BEEN DONE BEFORE....
TURNING ANY LENGTH TAPER THAT THE LATHE TAKES BETWEEN CENTERS
... IN ONE SETTING OF THE TAPER ATTACHMENT!***

THE first announcement of the new Monarch Anti-Friction Bearing Taper Attachment aroused widespread interest . . . and some skepticism. Never before had it been possible to turn accurate and smooth tapers under all conditions—to take heavy cuts at the most acute angles even up to 90 degrees included angle. Production Executives were frankly amazed at this Monarch development.

No longer is it necessary to reset the Taper Attachment, when turning long tapers, with the usual inaccuracy and marring of the work. All taper cuts made with the new Monarch Anti-Friction Bearing Taper Attachment (even to the full length capacity of the lathe) are continuously smooth and accurate . . . no matter how long . . . because such cuts are continued and uninterrupted.

Monarch Products Include:
 Engine Lathes . . . Tool Room Lathes
 . . . Special Manufacturing Lathes
 . . . Monarch-Keller Form Turning
 and Boring Lathes . . . The Monarch-
 Keller *Magna-Matic* Automatic Lathes
 . . . Model 5-T Lathe . . . High
 Speed Manufacturing Lathes
 Hydraulic Multi-Speed Lathe.

THE MONARCH MACHINE TOOL CO., Sidney, Ohio, U.S.A.

MONARCH LATHES

COVER THE TURNING FIELD

Newark Sales Office: 1060 Broad Street • Chicago Sales Office: 622 West
 Washington Boulevard • Pittsburgh Sales Office: 604 Chamber of
 Commerce Building • Indianapolis Sales Office: 3115 Meridian Street.

MODERNIZE WITH MONARCH

of the Washington Chapter, American Society for Metals.

Mr. Wohlgenuth was graduated from St. John's College, Annapolis, Md., in 1919. Until May, 1930, he was employed at the U. S. Naval Engineering Experiment Station and was associate metallurgist from 1923 until 1930 when he became associate metallurgist at the National Bureau of Standards. He is a Captain in the Chemical Warfare Service Reserve, U. S. Army. In June, 1936, he received his M.S.

degree from the American University in Washington.

Yield Point of Structural Steel

Summarizing the results of 11 years of work of the research committee on the yield point of structural steel, M. O. Withey of the University of Wisconsin presented the final report of the committee and asked that it be discharged, a favor that was granted. Tests run at the Carnegie-Illinois Steel Corp.'s and the Bethlehem Steel Co.'s laboratories as well as by

three university laboratories revealed that the yield point showed an average reduction of approximately 2 per cent between one day and one month from time of rolling and that there was little change thereafter. On the other hand, the tensile strength increased slightly. These laboratories indicated that there was a much greater improvement in ductility as evidenced by an average increase of 30 per cent in reduction of area and 8 per cent in percentage elongation in 8 in. between ages of one day and 180 days. Tests made by Carnegie-Illinois on structural shapes between the ages of 2 hr. and one day showed an even more pronounced increase in ductility.

The committee found that it is not possible to predict accurately the yield point from the ultimate strength, since the ratio of yield point to tensile strength varied from 0.49 to 0.64 for the whole shapes tested. Ranges in both yield point and ultimate strength were found to be quite large, particularly in the former, apparently due to the differences in cooling and rolling to which the different portions of the shapes were subjected.

Reliability of test results, the committee found, depended largely upon the proper technique being used in the tensile test. All things considered, the drop-of-beam method is found to be the simplest and quickest means to detect the yield point, but it is highly important that the rate of strain be held within certain maximum limits while the material is passing through this range. Tentatively for wedge grips and an 8-in. gage length, the suggested maximum limit for the rate of strain in the vicinity of the yield point is 0.0015 in. per in. per min., which would correspond to a stress limit of 45,000 lb. per sq. in. per min. It is further recommended that the conventional speed requirements for the determination of the yield point based on the speed of the head running free be discarded. Yield point can be raised by as much as 10 to 12 per cent by raising the free speed of the head up to 2 in. per min.

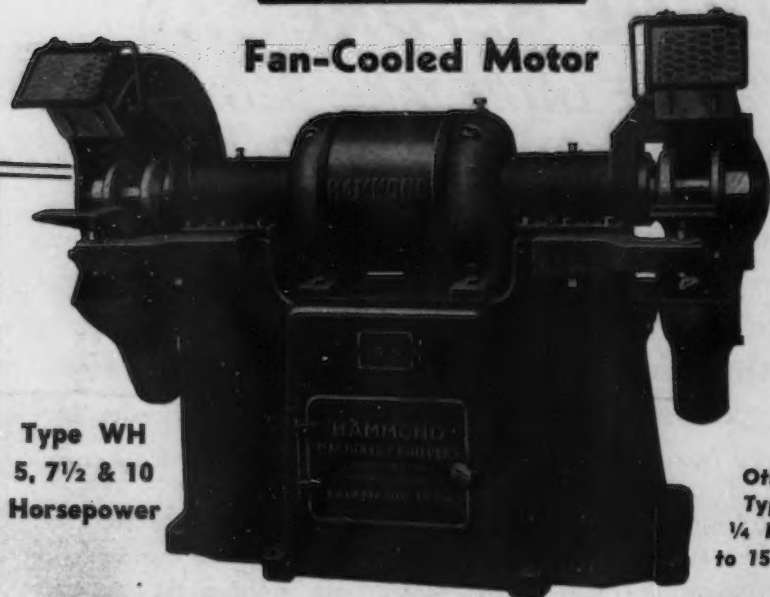
Magnetic Testing

In a paper replete with complex mathematical formulas, Carl Kinsley, consulting engineer, explained in detail the electrical theory embracing magnetic testing, whereby steel microstructures are identified and flaws located by means of balancing wave tests. When a bar of the steel to be tested is inserted in the field coil an electromagnetic force is set up which can be balanced by a current having a definite phase relationship and amplitude. Through experimental data it is

BANISH these Imps of Motor Destruction



Fan-Cooled Motor



Type WH
5, 7½ & 10
Horsepower

Other
Types
¼ H. P.
to 15 H. P.

Set New Standards of Electric Grinder stamina and dependability by elimination of iron dust, metal chips, emery grit and shop dirt from motor windings. Write for bulletins showing complete line of grinders and polishers. Address Department 12.

EASTERN
BRANCH:
148 W. 23rd St.,
New York

Hammond Machinery Builders
INCORPORATED
KALAMAZOO, MICHIGAN, U.S.A.

Machinery Is More Dependable with Dodge Steel Castings...

Need More Dependable Machinery

- A Break-Down May Cost More Than a New and Better Machine

By **RAYMOND L. COLLIER**
Steel Founders' Society of America
Cleveland, Ohio

MECANICAL equipment must be able to stand the strain, take all the abuses of heavy production periods, and come up for more. In short, mechanized industry must be tooled up for safe operation at the feverish tempo of present-day business. It might cost more than a machine is worth to have it break down in the midst of a production program where prompt delivery of the finished product to the customer is essential.

It may be that a given piece or part of a machine vital to sustained production should be replaced with a stronger, tougher component. It may be that whole machines should be radically redesigned and constructed of sturdier members.

It is well to remember that a machine is only as strong as its weakest structural component. If a gear or pinion fails, if a brace or side frame cracks, if a housing or a journal gives away, or if moving parts shatter or jam due to structural weaknesses, the machine loses all of its value until repair parts can be rushed in to recondition it. Meanwhile, valuable time has been lost, badly needed workmen may have been sent to the hospital, and production schedules knocked into a cocked hat.

The plant superintendent, with his assistants, can perform an invaluable service by ferreting out possible weak spots in each piece of plant equipment where mechanical trouble is likely to develop, and requisitioning replacements in which implicit confidence can be imposed.

The machinery builder can not afford to market equipment which falls short of being the very best that can be built, from a structural standpoint. His reputation is at stake. His machines simply must meet the test. His designers and purchasing agents must forget the practice of building machinery down to a price, and adopt the policy of building them up to a standard—the highest possible standard of excellence and integrity, providing long and continuous service.

Competition in the machinery field should be on the basis of performance in service, longevity of satisfactory operation, quality of production—not the price per pound of installed equipment. Lower workmen's compensation rates, less out-of-pocket expense, lower repair costs and higher production per unit of life—these are the things a machinery user really wants to buy.

Reprinted from "Concrete" May, 1937

Dodge Steel Company

6501 TACONY STREET • PHILADELPHIA, PA.

possible definitely to identify the structure of a given material following heat treatment. If flaws are present, the phase relationship is disturbed and will show up in the electrical measuring instrument. Comments from the floor indicated that the technique is still pretty much a research laboratory tool and has not yet entirely proved its utility in routine inspection in the mills. Some doubt was cast on the ability of such apparatus to detect flaws in steel as indicated by some of the experiences of those present.

Discussion of Welded Metals

In reviewing the characteristics of weld metals and the methods of testing them, L. J. Larson, welding engineer, of the A. O. Smith Corp., brought in a great deal of data showing the superiority of coated as against uncoated weld rods. His discussion was limited entirely to metallic arc welding. Since the weld metal is subjected to the same stresses as the parent metal, it is important to know its characteristics, but it is difficult to get a sample of uncontaminated weld metal for tests, so that the usual test procedure is modified. It is practically impossible to get a standard cylindrical sample, for example, but rectangular sections can be employed, sometimes including stock metal, thereby showing up the effect of the parent metal on the weld. Because failure often occurs outside the weld, however, tension tests on a section across the weld gives little data on the yield point and the ductility of the weld metal proper, which can only be had by testing a sample of the pure weld metal as deposited. Measurement of elongation by a bend test across the weld is much more reliable, since it is a relatively simple matter to measure the stretch of the material on the outer surface of a weld when the section is bent into a U-shape. Fatigue and impact tests may be made on weld metal, but the parent metal should not be included in the sample.

There are both destructive and non-destructive tests available for soundness. By using a notched specimen which is broken by a heavy blow, the fracture can be examined for porosity and slag pockets. Another method is to determine the specific gravity of a carefully turned cylinder of weld metal, but this is more often a comparative test to determine the particular type of weld metal to be used under the circumstances. Included in the non-destructive tests are a hammer and stethoscope technique for measuring the sound transmitted, but this is not very sensitive. Flaws can sometimes be detected by disturbances in the

magnetic field as determined by the placement of iron filings after the piece has been magnetized. X-ray or radiographic methods are well-known, but this is an expensive test and will not reveal very small pin holes in heavy material.

The usual chemical tests may be made on weld metal, including the determination of carbon, manganese, phosphorus and sulphur, but the determination of the amount of oxygen and nitrogen present in the weld seems to Mr. Larson much more important. The presence of nitrogen makes the material hot short, increases the strength and reduces the ductility. A specific analysis presented showed that bare wire weld metal in the deposited state contained 0.298 per cent oxygen, as against 0.072 per cent in the coated weld metal; and 0.131 per cent nitrogen in uncoated as against 0.010 per cent in the coated material. Even more important, was the form in which the oxygen occurs. In an example of bare wire weld metal, practically all of the oxygen existed in the form of FeO, whereas in the coated rod the FeO was very low and the oxygen occurred mainly as SiO₂, a much less

harmful form as regards physical properties.

Photomicrographs presented indicated typical nitride needles present in the weld metal from an uncoated rod and crack lines developed from hot shortness. The junction point with the parent metal is very marked, whereas in the case of coated rods, the line of demarkation is barely discernible.

Argument on Impact Tests

In a brief paper H. C. Mann of the Watertown Arsenal presented some strong arguments in favor of tension impact tests as being invariably more accurate than the notch test type, such as is used in the Charpy test. In the former, the column of the test material is much more readily determined and the energy of impact remains practically constant regardless of gage length. There was vigorous protest from the floor against discarding the notch-test technique after so many years of study of its phenomena.

Wire Corrosion Tests Under Way

An interim report submitted by the wire test committee indicated

INSTEAD OF *Writing*

Once in a while a prospective buyer asks us what guarantee goes with a Warner & Swasey Turret Lathe. The answer is—we never consider any sale complete until the buyer is making a profit on his Warner & Swasey investment.

Warner & Swasey Turret Lathes earn an average net profit of 20% for their users, often increase production 30% and cut costs 50%. Whether or not a Warner & Swasey would do as much or more in your particular plant is something we can tell you before you invest a penny.

For 57 years Warner & Swasey has been building for industry a machine (and a reputation behind it) that produce their own guarantees, in predetermined results, in your production line.

**WARNER
&
SWASEY**
Turret Lathes

Cleveland

that the 20-year testing program on wire including farm-field fencing, barbed wire, unfabricated wire, wire strands, and chain-link fence was now well under way. During the latter part of 1936 and the early part of 1937 samples for various kinds of zinc-coated wire were exposed in standardized racks at 11 locations scattered throughout the United States, where widely different atmospheric conditions are obtained from seacoast to industrial types. A number of colleges are cooperating and the Bureau of Standards is to act as referee to test raw materials exposed in the test. It will be at least another year before the data on the originally exposed material becomes available for publication. C. L. Warwick, secretary-treasurer of the A.S.T.M., has acted as director of tests and H. E. Smith has functioned as engineer of tests thus far.

Proposes Classification of Graphite in Cast Iron

In order to stimulate the adoption of a standardized method for studying and recording graphite distribution in gray cast iron,

W. E. Mahin, Westinghouse Electric & Mfg. Co., and J. W. Hamilton, Vanadium Corp. of America, have proposed a standard classification of graphite somewhat similar to the A.S.T.M. grain size chart for steels. Graphite flake charts were proposed with ranges in flake size from 4 in. or more in length for No. 1, the intermediate points being placed 2 to 4 in., 1 to 2 in., $1\frac{1}{2}$ to 1, $1\frac{1}{4}$ to $\frac{1}{2}$, $\frac{1}{2}$ to $\frac{1}{4}$, $1/16$ to $\frac{1}{4}$, and $1/16$ in. or less. A classification based on distribution and orientation of graphite flakes is also proposed. Magnification is at 100 diameters. Type A is random orientation of flakes uniformly distributed; type B, random orientation of flakes grouped in rosettes; type C random orientation grouped in dendrites, and type D dendritic orientation of flakes. The authors ably defended their proposed system from attack from the floor. Further study is to be given it.

Properties of Cast Iron Depend Upon Thickness

The physical properties of gray iron castings are affected to a great extent by differences in section than those of other cast metals. In

heavy sections, which cool slowly, the strengths are less than in light sections which cool more rapidly. Slow cooling promotes the separation of graphite and results in a decrease in the tensile strength of the material. In a paper presented by H. L. Campbell, metallurgical engineer, American Hoist and Derrick Co., test data was presented to show that the tensile strength may vary from 23,300 lb. per sq. in. for material 1.2 in. in thickness to 50,800 lb. for materials 0.25 in. in thickness. The conclusion drawn is that in giving the tensile strength of cast iron, it is necessary always to state the size of the casting from which the test specimen was obtained.

Fatigue Properties of Non-Ferrous Sheets

In an exhaustive study made by G. H. Greenall and G. R. Gohn of the Bell Telephone Laboratories, it was shown that the fatigue endurance limit of non-ferrous sheet materials at 100,000,000 reversals of stress varies from approximately 13.5 to 40 per cent of the tensile strength. Hence it is obvious that tensile strength is no index of the fatigue limit, and that high tensile strength alone does not necessarily imply long fatigue life. The fatigue characteristics of non-ferrous sheet metals may be raised by cold working, but the resulting increase is not proportional to the increase in tensile strength. In the case of alpha brass, when precipitation hardening occurs by the addition of nickel silicide, the endurance limit is increased. Grain direction in materials such as cold-worked aluminum alloys affects the endurance properties, but in the case of alloys whose micro-structure reveals little or no directional properties, the fatigue properties are likewise unaffected by the grain direction. Small holes or additional working of highly stressed sections reduces the endurance limit below that of the original material. By proper surface preparation, such as polishing, the endurance limit may be materially raised.

The endurance limit will be lowered by the addition of plated finishes unless proper precautions are taken suitably to prepare the surface prior to the application of the plate. Reduction in grain size also adds to the endurance limit.

Corrosion Testing Procedure

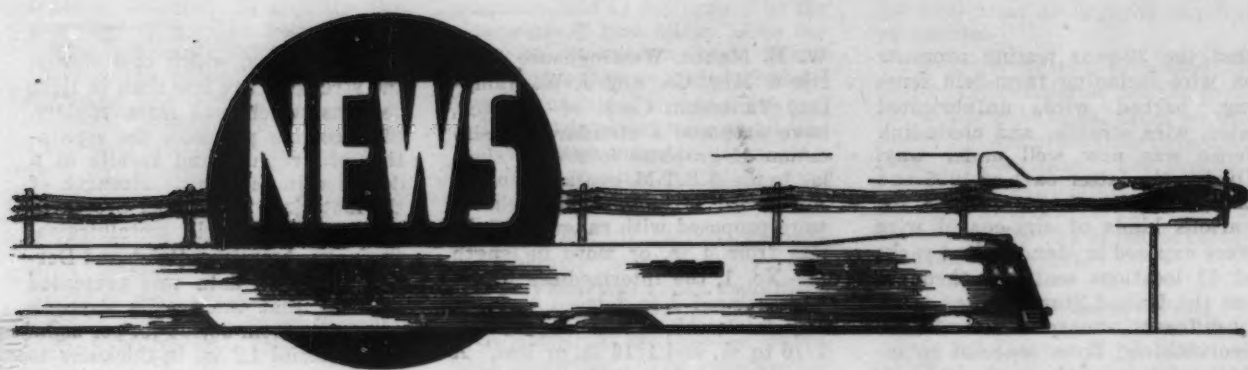
Carried over to this meeting was the discussion on six papers on corrosion testing delivered before the March meeting of the society in Chicago. Although it seems a desirable objective to standardize corrosion tests, the very fact that such

(CONTINUED ON PAGE 86)

Guarantees . . .



WE BUILD THEM



Changes in British Steel Industry In 1936 Are Surveyed

LONDON (*Special Correspondence*).—The first part of the annual statistical summary of the British iron and steel industry for 1936, just issued by the British Iron and Steel Federation contains a number of interesting groups of statistics which indicate various tendencies within the industry of great importance.

Among these are the increased consumption of pig iron in steel making and a fall in the proportion of scrap steel used in charging blast furnaces. Steel makers last year provided for their own furnaces 53.2 per cent of pig iron and scrap from their own works' resources, as against 51.6 per cent in 1935. This is mainly due to the expansion of completely integrated plants combining blast furnaces and steel furnaces, so that internal consumption of steel making material rose by 1,250,000 tons and external purchases by only 778,000 tons. The greater use of pig iron effected a saving in the consumption of scrap of about 60,000 tons,

which otherwise would have had to be imported.

Difficulties encountered in securing sufficient iron ore from abroad meant a heavier call upon domestic resources. British pig iron production last year was 1,297,000 tons higher than in 1935, requiring an additional 2,786,000 tons of ore. Of this extra quantity British deposits supplied 1,750,000 tons, the remainder coming from abroad. Most of the increased production came from the Oxford and Northamptonshire districts, but all areas, including the dwindling deposits in Cumberland and Cleveland, contributed larger tonnages.

Empire resources are being increasingly drawn upon, and from Sierra Leone, Newfoundland, and the Labrador coast three times as much ore has been imported as was the case two years ago.

The statistics also reveal the progress of blast furnace efficiency, coke consumption per ton of pig iron produced having been reduced and the extension of modern coke-oven practice having effected a reduction in coal equivalent burned.

The number of blast furnaces existing in the United Kingdom at the end of last year was 245, of which 110 were in operation. Dur-

ing 1936, 49 furnaces were dismantled, the greatest number being on the northeast coast, where 20 were handed over to the breakers. Only one new stack was erected during the year—at Wellingborough.

Hamilton Furnace Ready in August

THE new blast furnace being erected by the Hamilton Coke & Iron Co. near Hamilton, Ohio, will be ready for operation early in August, according to J. A. B. Lovett, vice-president and general manager of the company. Work on the furnace was started in December, 1936. The Hamilton Coke & Iron Co. is a completely owned subsidiary of the American Rolling Mill Co., Middletown, Ohio. Located only ten miles from one of Armco's chief plants, it supplies molten pig iron to the open hearth furnaces. A special train transports the liquid metal in huge "thermos bottle" tanks.

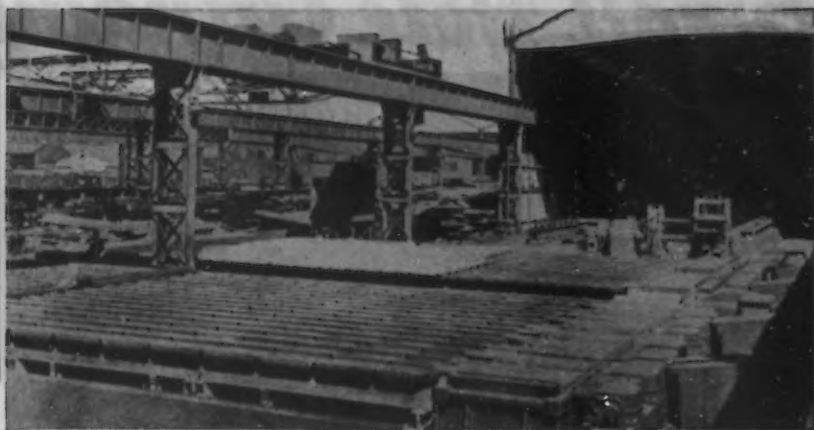
Completion of the new furnace will give the company a daily capacity of about 1200 tons of pig iron. The present furnace, which

NEWS AND MARKET INDEX

Personals	78	Machine Tool Activity	112
Obituary	85	Cleveland Market	113
Fabricated Steel	99	Philadelphia Market	114
June Pig Iron Production	105	New York Market	115
Steel Ingot Production	106	Non-ferrous Market	117
Summary of the Week	107	Scrap Market and Prices	118-119
Pittsburgh Market	108	Finishing Iron & Steel Prices	120-121
Comparison of Prices	109	Warehouse Steel Prices	122-123
Chicago Market	111	Pig Iron & Raw Material Prices	124
Plant Expansion & Equipment	128		

BILLET COOLING BEDS

*by
Morgan*



For Quality and Economy

Down to the last step of rolling mill operation, Morgan sets a high standard of economy and efficiency. The Morgan Billet Cooling Bed is designed and manufactured with scrupulous attention to detail, so that it continues to function smoothly and dependably year after year.

As it receives the billets, it moves them forward regu-

larly and delivers them straight, with ends carefully evened up for convenient stowing.

The complete rolling mill, like the cooling bed or any other part, reflects Morgan thoroughness of design and construction. In consequence, Morgan

Rolling Mills can be depended upon for economical and profitable service.



R 26

MORGAN CONSTRUCTION COMPANY. WORCESTER, MASS., U.S.A.

THE IRON AGE, July 8, 1937—73

was completely rebuilt and modernized last year, has a capacity of more than 700 tons a day.

Blast Furnace Hits Production Peak

A NEW record for production of pig iron was established by D furnace of the Central Furnace group of the American Steel & Wire Co., at Cleveland, a few days ago. This furnace in 24 hours produced 1001 tons of high silicon merchant iron. Its normal capacity is around 600 tons, but it had previously made a high record of approximately 900 tons when producing a different type of iron.

Operation of the Central furnace was assumed by American Steel & Wire Co. on May 1, this furnace having previously been operated about a year by the Carnegie-Illinois Corporation.

New Steel Developed In England

A NEW steel known as "Stay-blade Max" which is said to be suitable for working at temperatures up to and including red heat, to resist oxidation in air or steam in temperatures as high as 900 deg. C., and to be quite machineable, is reported to have been developed at Sheffield, England, ac-

cording to a report from the office of the American Consulate, London, made public by the Department of Commerce.

The steel has high chromium and nickel contents and also includes substantial additions of titanium and aluminum. The "time yield" value at 550 deg. C. is reported to be as high as 9½ tons per sq. in., which is said to make the steel suitable for working under fairly severe stress at high temperatures. The steel is of the austenitic type and can be formed into various sections. It is being tested at the present time in high temperature turbines in the form of blading, according to the report.

Westinghouse Plans World's Fair Exhibit

A CONTRACT for exhibit space in a building to be constructed by the New York World's Fair has been signed by the Westinghouse Electric & Mfg. Co. Extensive plans have been made by the company for its exhibit which, it was stated, "will include a scientific presentation of the way in which Westinghouse research and development work in the last 50 years will affect mankind and its affairs in the next half century to come. It will show thus not only the relationship of electricity and its development to man's concerns, but their future contribution to his health, wealth and wellbeing."

U. S. Steel to Have World's Fair Exhibit

UNITED STATES STEEL CORP. subsidiaries have signed a contract for 55,166 sq. ft. of building space at the New York World's Fair of 1939. Walter Dorwin Teague, well-known industrial designer, has been retained as consultant in the preparation of an exhibit in keeping with the theme of the exposition—"The World of Tomorrow." Mr. Teague and members of his staff are presently visiting operations of the corporation's subsidiaries in search of ideas for a dramatic and effective display.

Exports of metals and metal products, including iron and steel, machinery, etc., by associations organized under the Webb-Pomerene law rose to \$40,507,335 in 1936 from \$20,250,000 in 1935, according to reports filed with the Federal Trade Commission.

Small Hole Grinding



Mounted wheel held in chuck grinding small bore with spindle turning at 30,000 r.p.m.

RIVETT No. 104 INTERNAL GRINDER



THE Rivett No. 104 Grinder is designed to meet demand for a small hole grinder suitable for precision tool making and accurate manufacturing. It may be used as a single purpose machine in efficient production or readily and rapidly set up for the many varying requirements of the toolroom. Correct in proportion and design the extremely high spindle speeds required for

small hole grinding can be maintained within the required limits absolutely free from vibration.

Although primarily an internal grinder, an external grinding attachment can replace the internal spindle bracket. The Rivett fixed diamond method is used for truing both internal and external wheels. For further information write for bulletin 104-C.

RIVETT

LATHE & GRINDER INC.
BRIGHTON BOSTON MASS.



..PERSONALS..

J. F. BLACKIE, executive vice-president of the National Enameling & Stamping Co., Milwaukee, has resigned and will turn his attention to travel and his many personal interests. Since his connection with the company in 1924, he



J. F. BLACKIE

has devoted himself to production and factory problems. After completing his technical schooling at Massachusetts Institute of Technology, he began his career with the New England Coke & Gas Co. He later moved to Milwaukee and became identified with the Schlesinger Organization. During this period he rose from superintendent to vice-president and director in many of the companies in the Schlesinger Organization, including the Newport Co., Newport Chemical Works, Inc., and the Milwaukee Coke & Gas Co.

M. D. HOWELL, of New York, has been appointed a vice-president of Carnegie-Illinois Steel Corp. effective Aug. 15. Mr. Howell's duties will include the installation and supervision of new office procedure.

Mr. Howell leaves an association with the Chemical Bank & Trust Co. of New York, with which he has been connected since 1930 as vice-president. He was in direct charge of negotiating conditions and draft-

ing agreements for large industrial corporations' term loans, and has directed several important reorganizations. He has also specialized in the development and revision of corporate capital structures and budgets. His work included supervision of the bank's statistical research division, and membership on the senior officers committee and the management committee.

A graduate of the University of Michigan in 1912, Mr. Howell is 49 years of age. He received a degree in business administration and included all law school courses on business and corporation law. He is a public accountant, certified by the State of New York. From 1912 to 1919 he was traveling auditor and special accountant of the American Telephone & Telegraph

Co. He was president of the Southern Saw Works, Atlanta, Ga., from 1919 to 1921, reorganizing and rebuilding a circular saw factory.

As chief accountant of the Ohio Bell Telephone Co., Cleveland, from 1921 to 1924, Mr. Howell effected the consolidation of two large telephone properties, organized accounting and statistical work and developed control records and reports. As senior auditor of Lybrand, Ross Brothers & Montgomery, of New York, from 1924 to 1926, Mr. Howell's work was concerned with the auditing and accounting work involving corporate reorganizations, refinancing and accounting systems. From 1926 to 1928, he was accounting consultant, associated with the New York law

A SAW FOR EVERY METAL CUTTING JOB STARRETT HACKSAWS

S-M MOLYBDENUM
HIGH SPEED STEEL
TUNGSTEN ALLOY



Revised Starrett Catalog No. 25AA gives complete information about the entire line of Starrett S-M Molybdenum, High Speed Steel and Tungsten Alloy Hacksaws. Write for a copy.

THE L. S. STARRETT CO.

ATHOL, MASS., U. S. A.

World's Greatest Toolmakers—Manufacturers of Hacksaws Unexcelled
Steel Tapes, Standard for Accuracy
Dial Indicators for Every Requirement

Standardize on
STARRETT HACKSAWS
For Every Metal Cutting Need
BUY THROUGH YOUR DISTRIBUTOR



HIGH SPEED SENSITIVE MULTIPLE DRILLING AND TAPPING SMALL HOLES AT I. B. M.

MATERIAL RANGES FROM BAKELITE TO NORWAY IRON

Here are several examples of the high speed sensitive multiple drilling and tapping which is being done at the plant of the International Business Machines Corporation, Endicott, New York. Productions vary from 20 to 40 finished parts per hour, depending upon the number of operations performed.

Shown at the left are three NATCO D-5 High Speed Sensitive Multi-Driller and Tappers in actual operation at the I. B. M. plant. These machines are ideal for *all your small drilling and tapping operations*, as the adjustable spindle feature makes possible *its use on an unlimited number of different jobs*.

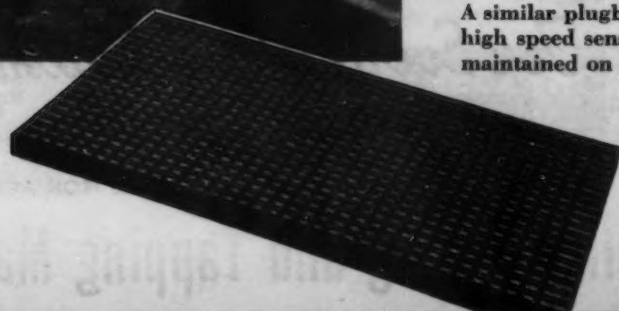
The NATCO model D-5 machine may be furnished as a driller only, a tapper only, or as a combination driller and tapper of either one or two horsepower capacity—arranged with either a 10 or 14 spindle head. The spindles are provided with $1\frac{1}{4}$ " vertical adjustment to compensate for tool grinding.

Operating efficiency was given first consideration in designing this machine . . . and all unnatural movements on the part of the operator have been eliminated. Yes, it's ideal for your small work on which small drilling and tapping operations are required.

680 Holes In Each of 20 Pieces Per Hour

Shown below is a black "Plugboard for an I. B. M. Tabulator." A total of 680 holes are drilled in each of 20 boards per hour by one of the NATCO D-5 machines shown at the left. This is accomplished by shifting the plugboard under the head until the necessary operations are completed.

A similar plugboard (not shown) is also drilled by this same high speed sensitive driller. A production of 40 per hour is maintained on this board, as two parts are drilled at a time.



12 Holes Were Tapped In 80,000 Norway Iron Plates Without Removing A Tap

Here is a record to shoot at—12 small holes were tapped in 80,000 one-eighth-inch Norway Iron plates without removing a single tap for grinding . . . yes, this record was made on the NATCO D-5 machine shown directly below at the left. There are a total of 24 small holes in each plate—drilled and tapped (12 holes at a time) in four operations. Average production is 25 pieces per hour. The illustration shows the machine arranged for the drilling operations.



Shown directly above is another NATCO D-5 machine which is being used at the I. B. M. plant. It is arranged with a permanent set-up and is equipped with a 20-spindle fixed center, gear-driven box. A close-up view of the spindle box and fixture plate is shown at the left.

Also shown above and below is the "Linen-Dilecto Set-up Plugboard for Tabulator" in which a total of 160 holes are drilled at an average production rate of 20 pieces per hour.

Another "plugboard" similar to the one shown is also drilled on the machine shown directly above at the right. This "plugboard" is of bakelite and somewhat thinner. A total of 680 holes are drilled (2 parts at a time) in each of 40 parts per hour.

Among the many types and sizes of Multi-Spindle Drilling, Boring and Tapping machines there is one that will fit your particular needs. Let NATCO engineers aid you in coming to a practical and profitable solution of your "hole problems." Call a NATCO representative . . . do it today.

Chicago Office—2009 Engineering Building.
Detroit Office—409 New Center Building.

The National Automatic Tool Co.
Richmond, Indiana, U. S. A.



Reduce
Production Costs!
Investigate NATCO
Methods Today

NATCO

Drilling, Boring and Tapping Machines

firm of Beekman, Bogue, Clark & Griscom, as an adviser on accounting and tax problems in connection with corporate financings and reorganizations.

From 1928 to 1930, he was comptroller of the Postal Telegraph & Cable Co., subsequent to acquisition and control of that company by the International Telephone & Telegraph Co.

While with the Chemical Bank he was a director of the Doehler Die Casting Co., the Valspar Corp., the

Northwestern Water & Electric Corp. and the Community Water Service Corp.

♦ ♦ ♦

FRED M. FULLER, of the Carnegie-Illinois Steel Corp., retired from active service on July 1 after being identified with the sheet and tin plate industry for more than 42 years. Mr. Fuller is well known throughout the industry and as a result of his experience is considered an authority on the sale and dis-

tribution of tin plate and sheets. Last week he was guest of honor at a testimonial dinner tendered by his former associates.

Before the consolidation of the American Sheet & Tin Plate Co. with Carnegie-Illinois Steel Corp.,



M. D. HOWELL

Mr. Fuller was assistant to the president of American Sheet & Tin, and following the consolidation acted in an advisory capacity in the sheet and tin plate divisions of Carnegie-Illinois.

He entered the employ of the Falcon Iron & Nail Co. and Falcon



F. M. FULLER

Plate & Sheet Co. as clerk at Niles, Ohio, in Sept. 1894. When the Falcon company was consolidated with the American Tin Plate Co. in 1898, he went to Chicago as chief clerk in the order department and subsequently was transferred to New

for Results- GENUINE OILGEAR SURFACE BROACHING MACHINES



● To men familiar with the Oilgear Variable Delivery Pump—with the inherent advantages it offers over its many imitations, the application of that completely controllable and dependable flexible power unit to Surface Broaching needs can mean only one thing. Oilgear Surface Broaching Machines offer a smoothness of operation and dependable performance beyond comparison. For high production at close tolerances, with almost negligible maintenance, experienced shops insist on Oilgear. For full description of these remarkable Oilgear Surface Broaching Machines, write for Bulletin 23,000A. THE OILGEAR COMPANY, 1303 West Bruce Street, Milwaukee, Wisconsin.

- One or more pieces finish-broached simultaneously
- Highest production at close tolerances
- Each unit complete and self-contained
- Single lever, semi-automatic control
- Automatic full interlock of broach and shuttle tables
- Welded all-steel construction
- 6, 10, 16, 20 ton capacities

OILGEAR SURFACE BROACHING MACHINES

York, when the general office was moved. Upon the formation of the American Sheet & Tin Plate Co. he was transferred to Pittsburgh and in 1905 entered the sales department. In 1909 he was appointed assistant general manager of sales in the tin plate division and on Jan. 1, 1934, was made general manager of sales to succeed the late J. I. Andrews. A year later he was appointed assistant to the president, which position he held up to the time of the consolidation of the American Sheet & Tin Plate Co. with the Carnegie-Illinois Steel Corp.

For the time being, Mr. Fuller will make his home in Pittsburgh.

◆ ◆ ◆

EVERETT D. GRAFF, first vice-president of Joseph T. Ryerson & Son, Inc., Chicago, has been elected



E. D. GRAFF

president. He has been with the Ryerson company for 31 years, having gone with the company immediately upon graduation from college in 1906. W. F. KURFESS and V. H. DIETERICH, assistant vice-presidents, have been elected vice-presidents, and AINSLIE Y. SAWYER, formerly assistant vice-president, has been made assistant to the president. EDWARD L. RYERSON, JR., is chairman of the board of the Ryerson company and vice-chairman of the Inland Steel Co.

◆ ◆ ◆

W. L. BEASLEY has been appointed works auditor at the Farrell works, having previously been works auditor at the Farrell steel works and furnaces.

◆ ◆ ◆

O. W. HASSEL has been appointed assistant works auditor at the Far-

rell works following employment as assistant works auditor of the Farrell-Mercer works.

◆ ◆ ◆

F. J. BRENNER has been appointed works auditor at the National works, Monessen, succeeding W. J. HOLLIDAY, who died recently. He was previous works auditor of the Farrell-Mercer works.

◆ ◆ ◆

CHARLES CRICKS has been appointed superintendent of the open-hearth department of the Farrell works. He was formerly assistant superintendent of the open-hearth department and succeeds G. W. HUMES, who has been appointed assistant general superintendent.

A. A. DOW has been appointed assistant to the superintendent of the open-hearth department. He was transferred to this position from the office of the manager of the metallurgical department for the Pittsburgh district.

◆ ◆ ◆

JOHN E. BECK has been appointed metallurgist, Pittsburgh works, Jones & Laughlin Steel Corp., succeeding WILLIAM L. WITNEY, who has been transferred to the operating department. A. A. ARCHIBALD has been appointed assistant metallurgist, Pittsburgh, succeeding Y. J. BRUCE, who has been transferred to the general metallurgical department, replacing Mr. Beck, in

FLAT ACCURATELY GROUND SURFACES ASSURE

Tight

Joints!



No. 16 Blanchard Surface Grinder in shop of a well-known maker of Diesel Engines for tractors, trucks, busses.

Larger cylinder heads up to the full swing of the machine, 36 in., are also ground to the same flatness.

The flatness of Blanchard Ground Surfaces ensures tight joints. There are no low spots ground or between holes in the surface.

Diesel Cylinder Head
Alloy cast iron
20 in. long
2 on chuck



.001 in. to .020 in. stock on each side
2 sides ground
Flat within .001 in.
15 pieces (30 surfaces) per hour

THE BLANCHARD MACHINE CO.

64 State Street
CAMBRIDGE, MASS.

metallurgical engineering work on cold finished products.

Mr. Witney has been with the Jones & Laughlin Steel Corp. since 1923 and for the last 14 years has held various positions in the metallurgical department and takes a wealth of experience with him to his new position.

Mr. Beck came with the company in 1927, starting in the metallurgical department of the Southside works and in 1935 was transferred to the general metallurgical department, where he engaged in engineering work on cold finished products.

Mr. Bruce has been with the Jones & Laughlin Steel Corp. since 1918, having started in the company's city office inspection department. Subsequently he was transferred to

the metallurgical department, Aliquippa works, and three years ago was appointed assistant metallurgist at the Pittsburgh works.

Mr. Archibald entered the metallurgical department of Jones & Laughlin in 1935 previous to which time he was field engineer for the Magnetic Analysis Corp., Long Island City. Within the past year or so he has done special metallurgical work relative to strip and sheet steels.

◆ ◆ ◆

W. J. ADAMSON has been appointed manager of sales for the hot and cold rolled strip division of Allegheny Steel Co. Mr. Adamson has had operating and selling experience for a period of over 27 years. He began his career in the steel business in the mills of the West

Leechburg Steel Co., West Leechburg, Pa. He later joined the Trumbull Steel Co. at Warren, Ohio, where he was soon promoted to the sales department. Later he became assistant general manager of sales and shortly after was appointed assistant vice-president, which position he left to become sales manager of the Acme Steel Co., Chicago. He left the latter position to enter the sales department of Allegheny Steel Co.

◆ ◆ ◆

HARVEY DEMMON has been appointed superintendent of maintenance, Farrell works, Carnegie-Illinois Steel Corp., Pittsburgh, in conjunction with the recent consolidation of the Farrell steel works and furnaces and the Farrell-Mercer sheet and tin mills. Mr. Demmon has been associated with the sheet and tin plate producing subsidiary of U. S. Steel for 17 years and prior to his present appointment was master mechanic at Farrell-Mercer works. He is a graduate of Purdue University and was in

PULLEYS • PULLEYS • PULLEYS

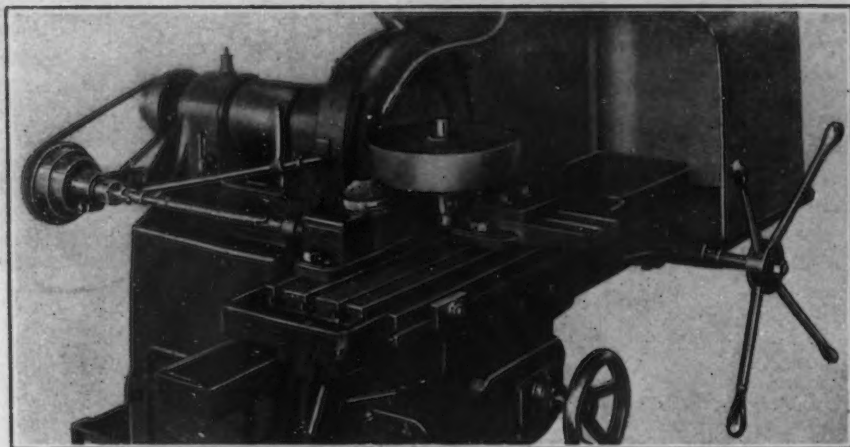
GRIND THE BELT SURFACES OF YOUR
PULLEYS FLAT OR CONVEX (OR CONCAVE)

FAST • FAST • FAST

30—50 SQUARE INCHES OF BELT SURFACE PER MINUTE!!!

Figure the grinding time on your own cast iron pulleys by using the following formula:

$$\frac{\text{Area of Belt Surface (sq. in.)}}{40} = \text{Grinding Time}$$



PULLEY GRINDING FIXTURES ON OUR OWN MACHINE

ABRASIVE PULLEY GRINDER WITH
EITHER 12" OR 18" RING WHEEL

HAND OPERATED TABLE COOLANT TANK AND PUMP

Circular On Request

ABRASIVE MACHINE TOOL CO.
EAST PROVIDENCE, R. I.



H. DEMMON

construction work for three years prior to his employment in the steam engineering department, American Sheet & Tin Plate Co. on Feb. 1, 1920. He was assistant resident engineer at the Vandergrift works of the company from March 1, 1924 to March 1, 1935, when he was appointed master mechanic at the Farrell-Mercer works.

◆ ◆ ◆

R. M. BEATTY has been appointed manager of range sales, Westinghouse Electric & Mfg. Co., East Pittsburgh. Mr. Beatty is located at Mansfield, Ohio, Westinghouse merchandising division headquarters. He has been with the company

STEEL

Goes to Business



COLD FINISHED BAR STEELS

Cold Drawn Bars



Ground Shafting



Ultra-Cut Steel



Special Sections



Alloy Steels



BUSINESS goes to STEEL for the efficiency of its mechanical equipment.

Swiftly pounding typewriter keys . . . the whirr of dictaphones . . . the busy ring of cash registers and adding machines . . . the click of telegraph instruments . . . and the excited clatter of market tickers . . . these and a thousand-and-one other business machines are made possible by the development of Cold Finished Steel.

From the innermost parts of these units, shine the brightly polished surfaces of myriads of spindles, shafts, guide rods, screws, pivots, collars, pinions and gears . . . all are fabricated from Cold Finished Bar Steels. They are smooth, accurate, strong and wear-resisting . . . and economically produced on high speed automatic screw machines at a cost which makes time-saving business equipment possible at a profit to its manufacturer.

Into these precision-built mechanisms, enters an ever increasing share of B & L Cold Finished Bar Steels. The accuracy and quality of these finely made steels contribute to the accuracy and durability of millions of modern office machines. May we help you on problems involving cold finished steel?

BLISS & LAUGHLIN, INC.

HARVEY, ILL.

Sales Offices in all Principal Cities

BUFFALO, N.Y.

for seven years, having been located at Chicago for the past three years in the capacity of sales promotion manager of the Northwestern district. Mr. Beatty was with the Lindemann & Hoverson Co., Milwaukee, and also the Domestic Electric Appliance Co., Peoria, Ill., prior to his employment with Westinghouse. He will be responsible for the sale of ranges as well as the various advertising, promotion and selling activities within the department. He is succeeding J. D. KELLY,

who has been transferred to New York on special assignment.

♦ ♦ ♦

R. M. McCULLOCH, who has been connected with the purchasing division of the International Harvester Co. for the past 33 years, was made manager of the purchasing department effective July 1, with headquarters in Chicago. Mr. McCulloch began work for the company in its Hamilton, Ont., plant in 1904, and in 1926 was made assist-

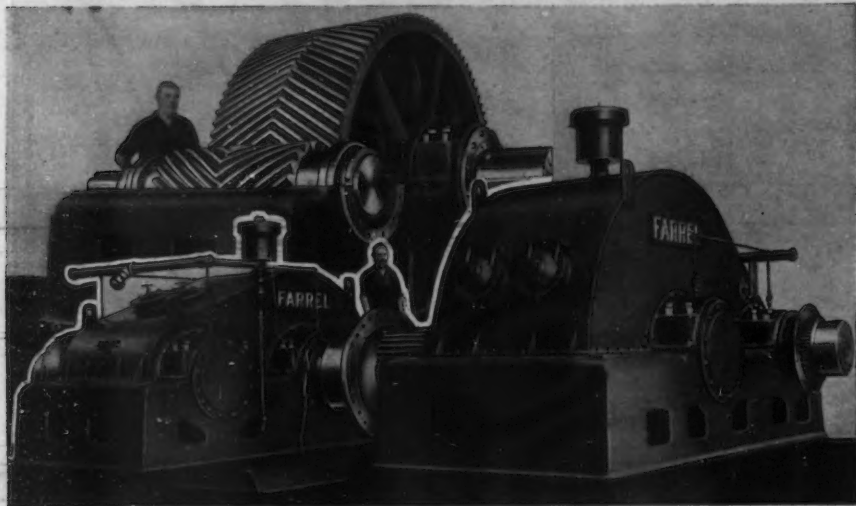
ant manager of purchasing, which position he held until his recent promotion.

♦ ♦ ♦

W. H. SADLER, formerly connected with the Detroit and Philadelphia offices of N. W. Ayer & Son, Inc., has been appointed director of public relations of the Edward G. Budd Mfg. Co., Philadelphia. Prior to his association with the Ayer company, he was engaged in newspaper work.

♦ ♦ ♦

GEORGE E. SMITH, superintendent of melting and forging, Midvale Co., Philadelphia, has been made general superintendent of the company in addition to his other duties.



PRECISION *and* STRENGTH for HEAVY DUTY SERVICE

Smooth, quiet operation is as essential in large mill drives as in smaller machines. High speeds and heavy loads subject the drive units to stresses and shocks which are successfully withstood only if the drives are properly designed for such service and built to high standards of accuracy.

The drives illustrated above are typical of the advanced engineering and precision manufacture of Farrel-Sykes Gear Units. The one at the left is a 4,000 H.P. drive for a 72" Four-High Reversing Cold Strip Finishing Mill and the unit at the right is a 1500 H.P. drive for the reel of the same mill. Inset shows the 1500 H.P. reel drive with its cover removed.

Both are single reduction units with cases of all-welded steel construction which have greater strength with less weight. The continuous tooth herringbone gears are accurately generated by the Sykes process. The gears are lubricated by built-in sprays and the bearings are flood lubricated, oil being supplied to both gears and bearings by a central lubricating system. The breathers mounted on the cover prevent oil contamination by trapping dirt and moisture.

Farrel-Sykes Gears and Gear Units are made in any capacity up to 10,000 H.P. for every type of industrial service. They are engineered to fit the job. When you have a drive problem send for a Farrel engineer.

FARREL-BIRMINGHAM
Company, Inc.

100 Main St., Ansonia, Conn.—333 Vulcan St., Buffalo, N. Y.



HARLOW F. WILSON, who has retired as secretary and auditor of the Columbia Steel Co., San Francisco, as announced in these columns last week.

H. B. ALLEN, who for 14 years was New York district sales manager of the Babcock & Wilcox Tube Co., New York, has resigned to become vice-president of John B. Astell & Co., New York, distributor in the Metropolitan district of Babcock & Wilcox seamless steel boiler tubes and other tubular products, including all kinds of welded fittings.

♦ ♦ ♦

FRANK T. SHEETS, for the past four years consulting engineer and director of development for the Portland Cement Association, Chicago, has been made president, succeeding EDWARD J. MEHREN, who resigned last month to take care of his personal interests.

♦ ♦ ♦

PAUL FIELDEN, who has been identified with the Norton Co., Wor-

cester, for the past 17 years, has been elected president of the National Association of Credit Men.



VICTOR M. WITMER, president of the Milwaukee Structural Steel Co., Milwaukee, has become a member of the newly formed Fifty-Year Club of alumni of the Rensselaer Polytechnic Institute, Troy, N. Y. He was graduated from the college in 1887. Club membership is limited to alumni of 50 years' standing.



HENRY R. HORTENSTINE (above), new president of Hunter Steel Co., Pittsburgh, and Paul A. Smith (below), vice-president and general manager, whose appointment was announced in these columns last week.



RALPH W. BURK, sales manager, and JOSEPH B. ARMITAGE, chief engineer, Kearney & Trecker Corp., Milwaukee, manufacturer of milling machines, have returned from a European trip of three months' duration for business prospect observation and visits to company representatives in 13 countries.

WILLIAM PRINTZ, who has been identified with the temperature control instrument field for the past 20 years, has been appointed for the Eastern division of the Wheelco Instruments Co., Chicago. He will make his headquarters at 45 West Thirty-fourth Street, New York.



H. F. BOE, since last year Eastern district manager of the Westinghouse Electric & Mfg. Co., has been appointed commercial manager of the company. In addition to being

responsible for the sale of Westinghouse products in the Eastern district, Mr. Boe will direct the commercial activities of the apparatus divisions. He has been associated with Westinghouse since 1900.



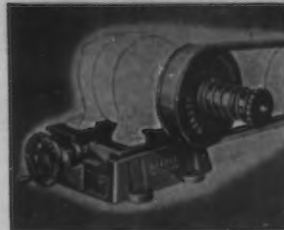
BASSETT LERCH has been transferred from the home office of the Mercoid Corp., Chicago, to the company's office at Brentwood, St. Louis County, Mo. RUSSELL MACDONALD has joined the Boston office of the company, and PAUL J. PROVOST is

HERE'S WHY THE OPERATOR OF THIS MACHINE CAN TURN OUT MORE AND BETTER WORK...

THE 3 BASIC UNITS IN THE COMPLETE REEVES LINE



Reeves Variable Speed Transmission



Reeves Vari-Speed Motor Pulley



Reeves Vari-Speed Motodrive



• OF COURSE the operator of a REEVES-equipped machine can give a good account of himself! The correct speed for every job is at his finger-tips. Merely by turning the control handwheel, he secures any speed over an infinite range between fastest and slowest—instantly, accurately!

... Fullest advantages of variable speed control are secured only when the correct unit is applied. REEVES engineers have developed a complete line of variable speed equipment—based on the three units shown at left. A wide variety of modern, time-tested units is available, in proper sizes, designs, speed ratios and controls to match any specific requirement... The nation-wide REEVES engineering organization is at your service, without obligation.

REEVES SPEED CONTROL

FREE—New edition of Speed Control Handbook. Describes REEVES line; illustrates many applications; gives valuable new engineering data.

REEVES PULLEY CO., Dept. I-77, COLUMBUS, INDIANA

Send, without obligation, copy of your new, 118-page Speed Control Handbook.

Name

Company

Address

now located at the Philadelphia office.

♦ ♦ ♦

H. J. MAUDERER, who has been identified with the Westinghouse Electric & Mfg. Co. since 1920, has been elected auditor of the Westinghouse Electric International Co., New York.

♦ ♦ ♦

D. G. HARRIS has been appointed works auditor of Carnegie-Illinois Steel Corp.'s Pencoyd plant, Philadelphia, replacing W. E. MARKS, who has been transferred to the American Bridge Co.

♦ ♦ ♦

COL. A. C. DOWNEY has been appointed president of Airtemp, Inc.,

the subsidiary of Chrysler Corp., which manufactures air conditioning equipment, and R. L. BIGGERS has been named president of Fargo Motor Co., the division which handles the sales of all the corporation's cars and trucks to fleet users. Colonel Downey was formerly president of Fargo and Mr. Biggers was formerly vice-president of that division. Colonel Downey, whose headquarters are at the Airtemp plant at Dayton, Ohio, has been associated with Walter P. Chrysler since shortly after the World War. He was graduated from Georgetown University Law School in 1917, and during the War served as chief procurement officer for the Air Service of the War Department. He joined Mr. Chrysler's staff when the latter was engaged in reorganizing Willys-Overland

and later, when Mr. Chrysler took over the reorganization of Maxwell-Chalmers, Colonel Downey became general purchasing agent. He continued in that capacity when Chrysler Corp. was formed. After the purchase of the Dodge properties, Colonel Downey became vice-president of Dodge in charge of trucks, and later president of the Fargo division in charge of the development of the corporation's fleet business. In his present position Colonel Downey is responsible for the engineering, manufacturing and sales of the corporation's air conditioning business, the growth of which recently required a separate manufacturing plant.

Mr. Biggers has been engaged in the automobile business since 1919. He left an engineering course in the University of Michigan to join the Naval Air Service during the War, and shortly thereafter became experimental engineer of tractors and trucks for Graham Brothers, whose truck was later acquired by Dodge. Mr. Biggers was director of sales promotion and development of the Dodge Brothers truck operations when the Chrysler Corp. acquired Dodge. He left the corporation for a short period in 1929 to engage in the advertising agency business in Chicago, but returned in 1930 to work under Colonel Downey as assistant director of truck sales. He was later promoted to vice-president of Fargo and now will have charge of sales to fleet users of all the corporation's cars and trucks.

♦ ♦ ♦

W. C. STEWART has been appointed technical adviser of the American Institute of Bolt, Nut and Rivet Manufacturers, succeeding W. Y. ACRES, who recently resigned to take a position with the Bolt and Nut Division of the Bethlehem Steel Co. at Lebanon, Pa. Mr. Stewart was formerly employed by the General Electric Co. at Schenectady, N. Y., where he served in the mechanics section of the research laboratory and the engineering general department. He is a graduate of Washington University, St. Louis. He will carry on the work of the technical department under the direction of HARRY C. GRAHAM, chairman of the committee on standards and technical practices.

♦ ♦ ♦

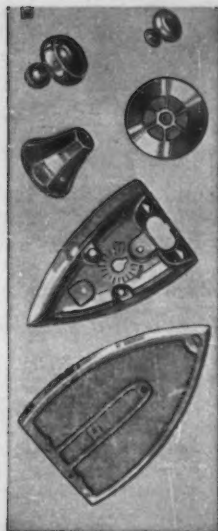
VAN B. HOOPER, advertising manager of the Louis Allis Co., Milwaukee, has been elected president of the Milwaukee Association of Industrial Advertisers, a member of the National group.



NO. 1 ROTARY TYPE

POLISH BUFF

Automatically
**LOWER HOUR COSTS
JUMP PRODUCTION**



"From 327 to 840 per Hour," one of the many statements from manufacturers, from toys to automobiles, who are cutting hour costs and jumping production by using PACKERS. Volume Polishing and Buffing must be done automatically to be profitable—PACKER'S are *automatic* — 3 types, **ROTARY**, **STRAIGHT LINE CONVEYOR** and **PORTABLE VERTICAL**.

SEND FOR CATALOG....

or send a sample of the finish required and production desired, and a definite "Proposal" will be sent—no obligation.

WRITE ENGINEERING DEPT.

PACKER

Automatic

POLISHING & BUFFING MACHINES

THE PACKER MACHINE CO., MERIDEN, CONN.

...OBITUARY...

JOHN T. UNDERWOOD, retired chairman of the Underwood Elliott Fisher Co., and founder of the Underwood typewriter business, died at his summer home at Wianno, Cape Cod, Mass., on July 2. He was born in London, England, April 12, 1857.

♦ ♦ ♦

CHARLES PHILIP BOSSERT, widely known Milwaukee mechanical engineer, died on June 27, aged 71 years. He was a graduate of the college of mechanical engineering, University of Wisconsin, in 1888, and afterward was associated with concerns in Chicago, Jackson, Mich.; Troy, N. Y.; Hortonsville, N. Y., and Milwaukee, retiring in 1928 because of ill health. Mr. Bossert was born in Milwaukee.

♦ ♦ ♦

HUGO E. VOLCKMANN, secretary-treasurer of the Village Blacksmith Folks, manufacturer of cutlery, Watertown, Wis., died on June 25, aged 66 years. He was born in Watertown and established the cutlery works about 33 years ago.

♦ ♦ ♦

JOHN F. DEVINE, founder and president of the J. F. Devine Pattern & Mfg. Co., West Allis, suburb of Milwaukee, died on July 1, aged 53 years.

♦ ♦ ♦

JOHN F. HARMON, secretary of the Geuder, Paeschke & Frey Co., Milwaukee, died of a heart attack on June 22, aged 64 years. He became ill on a train at Oakland, Cal., while bound for San Jose, Cal., to meet Mrs. Harmon and return home with her. Mr. Harmon was connected with the company for 47 years.

Manganese Ore Imports Up in 1936

DEMAND for manganese ore was so great in 1936 that imports gained 121 per cent over those of 1935, according to a report of the United States Bureau of Mines. Shipments from domestic mines increased only 22 per cent over those of 1935. Domestic shipments of ore containing 35 per cent or more manganese amounted to 32,119 gross tons averaging 45 per cent manganese compared with 26,428 tons averaging 44 per cent in 1935.

These shipments were exclusive of those from Porto Rico, which shipped 3010 tons to the United States compared with 3358 tons in the previous year. Montana supplied 51 per cent of the domestic manganese ore, Arkansas 14 per cent, Georgia 12 per cent and Tennessee 11 per cent. Utah, Virginia and West Virginia supplied small amounts.

Rust Engineering Co., Pittsburgh, has been awarded a contract for excavation, reinforced concrete foundations, the filling of the site and terra cotta sewers for an addition to the slabbing mill and new soaking pits at the Edgar Thomson works of the Carnegie-Illinois Steel Corp. at Braddock, Pa.

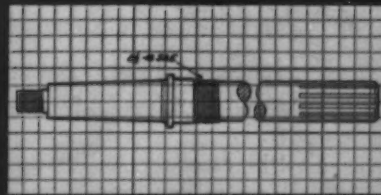
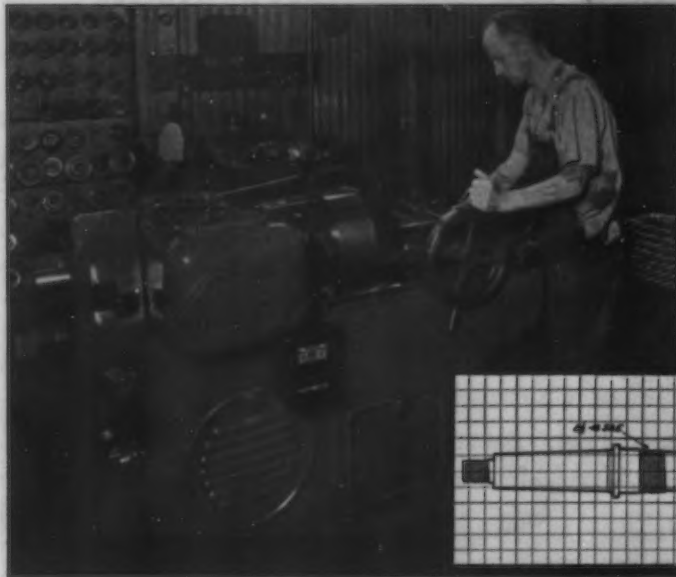
..TRADE NOTES..

Roots-Connersville Blower Corp., Connersville, Ind., has established a Detroit office at 211 Curtis Building. A. G. Bradbury is district representative.

Loeffer-Greene Supply Co., Oklahoma City, Okla., has been appointed distributor in that territory for Mercoid Corp., Chicago. A complete stock of automatic controls will be carried.

Uecker Equipment Co., Milwaukee, manufacturer and distributor of a new type of tubular steel scaffolding for contractors, has changed its title to Safway

Same job—same operator / —but double the production!



A LANDMACO Threading Machine recently installed by Edwin L. Stanton, Inc., Los Angeles, Calif., increased production on axle shafts 100%.

These shafts have a Brinell Hardness of 341, and, although the threads are held to a Class 3 fit, production averages 50 axles per hour, with 200 threads between grinds of the chasers.

Let us tell you what a LANDMACO will do for your threading operations. Write today.

LANDIS CHECK BOOK



... are you handling your threading jobs efficiently?
..... The Check Book will tell you!

Write for your copy today

LANDIS MACHINE CO., Inc. WAYNESBORO, PENNA.

Steel Scaffolds Co. It has just moved into a new office and warehouse building at 6228 West State Street. Manufacture of the scaffolding for the present will continue under contract with the James Mfg. Co., Fort Atkinson, Wis., and Dual Combustion Co., Plymouth, Wis.

Edgar T. Ward's Sons Co. has moved its Milwaukee office and warehouse from 1811 South Sixty-sixth Street to 6623 West Mitchell Street, West Allis. The branch is under the management of Fred O'Dell.

Harnischfeger Corp., Milwaukee, has appointed Francis Leslie and U. V. Westover

as sales engineers in the New York territory for P&H Smootharc welders and weld rods.

Interstate Machinery Co., Inc., Chicago, has moved to new quarters at 109-111 South Clinton Street.

Eastern Machinery Co., Cincinnati, has moved to 1002 Tennessee Avenue.

Designers for Industry, Inc., Cleveland, industrial designers and product stylists, have established a New York office in International Building, Rockefeller Center. A designing staff will be maintained at

this office under H. C. Gooding. George E. Henry has been appointed sales promotion manager.

Roloff Engineering Co., Milwaukee, has been appointed Milwaukee sales representative for Ajax Flexible Coupling Co., Westfield, N. Y.

Clark Brothers Co., Olean, N. Y., manufacturer of gas engines and compressors, has been merged with S. R. Dresser Mfg. Co., Bradford, Pa., pipe line equipment producers. This merger brings together two of the oldest oil field equipment manufacturers in the East.

Builders Iron Co., Inc., New Haven, Conn., formerly at 67 Winthrop Street, has recently moved to a new plant at 164 Hallock Avenue. Company manufactures steel hatchways and fabricates structural steel. G. W. Lyons is president.

A.S.T.M. Meeting Held in New York

(CONTINUED FROM PAGE 71)

standardization immediately restricts investigations led to the generally expressed opinion that standardization of corrosion tests was not possible. At best all that can be hoped for is a code of minimum requirements suggested to avoid gross errors in testing. In an attempt to reduce the number of variables there is lost that variation in factors that occurs under actual service conditions.

The unanimous belief was expressed that the loss in weight of a specimen is not an accurate gage of the effect of corrosion and that measurement of loss of tensile strength and elongation was much more significant, whether the metal tested was later to be subjected to stresses or not. The tensile test may also be used to estimate the resistance to impingement attack, such as occurs in brass condenser tubes.

Accelerated tests, and particularly the salt spray test came in for a great deal of criticism. The usual salt spray chamber hardly simulates service conditions where mist rather than wetness prevails. By operating the tank for 16 out of 24 hr. and letting the specimen dry between times, is a means of overcoming some of the errors. A plea was also made for more sensitive testing of specimens subjected to natural corrosion conditions, rather than cruder measurements made on accelerated test specimens. Dr. R. M. Burns, of the Bell Telephone Laboratories, described an electrochemical test by which it is possible

AIRLESS BLAST CLEANING EQUIPMENT



THE NEW PANGBORN ROTOBLAST "ROCKER" BARREL

An Airless Cleaning Machine Designed to Handle Flat, Mixed, Long and Fragile Work. Also All General Cleaning Work.

THIS compact Airless Barrel, with its Folding Conveyor Drum, is Pangborn's answer to the demand of industry for a super cleaning machine. Designed for flat, mixed, long and fragile work, as well as all the usual sizes and types of gray iron, steel, alloy and malleable castings; forgings; steel products and heat-treated parts, etc., this machine gives fast cleaning with low power, labor and maintenance costs. Made in 6 and 12 cubic feet capacity.

Write for Bulletin No. 209

PANGBORN CORPORATION • HAGERSTOWN, MARYLAND
THE WORLD'S LARGEST MANUFACTURER OF BLAST CLEANING AND DUST CONTROL EQUIPMENT

PANGBORN

to detect variations in the order of one-millionth of a gram per cu. cm.

Too little is known about the destructive and protective elements in the atmosphere. For that reason there is no ideal accelerated test of atmosphere. It is generally known that in industrial areas, there is a large amount of SO₂ gas in the air, but its action and dispersion depends largely upon atmospheric conditions. On still cold days in the fall and spring when the dew point is high, very heavy concentrations of sulphuric acid constituents collect on exposed metal parts. In this connection it was brought out that what is important is not so much the sulphur content of the air, but that in the moisture film in actual contact with the metal.

Another speaker in criticising salt spray tests indicated that inverse results were obtained on cadmium and zinc coatings on steel as compared with the same materials subjected to actual atmospheric exposure.

The corrosion meeting left many wondering whether any laboratory tests were really worthwhile. Often tests appear too academic since actual service conditions can seldom be repeated in the laboratory. At best a compromise must be effected between the scientific and the engineering point of view, the latter of which is more interested in predicting performance of metals in specific applications, rather than being concerned with laboratory technique.

Measurement of Elastic Drift in Spring Metal

Spring elements in precision instruments may be subject to appreciable errors as the result of elastic drift, or deviations in elastic deflection occurring with time under a constant load, according to a paper presented by Robert W. Carson, Instrument Specialties Co. Mr. Carson describes a recording electronic micrometer developed to measure deflections of spring members without disturbing the load deflection and sensitive to deviations as small as a millionth of an inch. Typical records show that drift continues indefinitely at a decreasing rate as long as the load remains. Immediately after applying the load, drift proceeds to go rapidly and the recording mechanism cannot keep up with the changes. During the first few minutes of the test, particularly where the amount of drift is large, the recorded curve usually shows breaks in the rate of deviation to which it generally averages out.

Investigation of the factors affecting drift shows that the in-

ternal stress conditions are by far the most important, particularly in cold-worked materials. The effect of heat treatment, time under load, stress intensity, type of loading and repeated cycles of load, as well as the characteristic drift in the various materials have also been studied. Most of the material studied were non-ferrous spring metals.

Dynamic Tests of Structures

Dynamic testing by means of induced vibrations is being applied

to a wide variety of structures, including buildings, bridges, vehicles, aircraft and ships, as exemplified in a paper presented by Rudolf K. Bernhard, consulting engineer, Baldwin-Southwark Corp. In the method discussed, vibration is induced by centrifugal forces resulting from two revolving eccentric disks. Oscillators have been built for frequencies between 1 and 100 cycles per sec. and with centrifugal forces between 1 and 50,000 lb. Assuming an amplifying

CLECO B1 SCALING TOOL



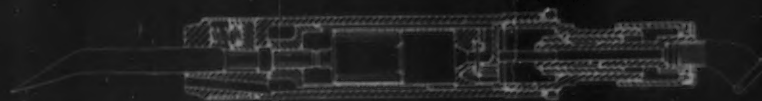
A Scaling Tool That's Different!

Different—and better—is this CLECO B1 Pneumatic Scaling Hammer. One outstanding special feature is the graduated control valve at the rear end of the tool—the harder you press, the more power you get! A special tool retainer holds the chisel securely yet releases it at a touch of the thumb. A square brached chuck keeps chisel from twisting. Exhaust blows away chips and scale.

CLECO B1 is ideal for general scaling, peening and beading; for undercutting when overlapping is necessary; for removing splatter after production welding.

Demonstrations arranged anywhere.

Let us mail you Bulletin 84.



THE CLEVELAND PNEUMATIC TOOL COMPANY

1734 EAST 78th STREET, CLEVELAND, OHIO, U. S. A. — Cable Address: PNEUMATIC
BRANCHES IN PRINCIPAL CITIES

*Flat Head
CAP SCREWS
ARE AVAILABLE
IN ALL SIZES
required*



• Uniformity of Cleveland Cap Screws is the result of careful control of manufacturing methods, and none of our products exhibits this care in manufacture more plainly than Flat Head cap screws. Accuracy of head and thread, adequate tensile strength, correctly cut slots—these are characteristic of our products. Made in a full list of sizes, American Coarse thread, any quantity you may need is ready for prompt shipment from the nearest warehouse or the factory, or your nearest distributor who stocks them. Ask for Catalog E—and current Price List. THE CLEVELAND CAP SCREW COMPANY, 2929 E. 79th St., Cleveland, Ohio.

CLEVELAND CAP SCREWS
SET SCREWS • BOLTS AND NUTS

Address the Factory or Our Nearest Warehouse:

CHICAGO, 726 W. Washington Blvd.
PHILADELPHIA, 12th & Olive Sts.
NEW YORK . . . 47 Murray Street
LOS ANGELES, 1015 East 16th St.

factor of 40 on a bridge structure, for example, the largest alternating force of the heavy oscillator may become as high as 2,000,000 lb. The nearer the resonance point of the oscillating system at which the tests are carried out, the smaller the required energy input and the more economical the investigation will be. Plotting the power input against the revolutions of the disks, characteristic curves can be obtained, which indicate the natural frequency of the vibrating system being investigated.

Vibrating a structure with this type of oscillator for a long period has in many cases a similar effect as annealing. Internal stresses remaining from the rolling process or due to welding are in some measure dissipated over the complete structure. A change in the natural frequency may indicate some failure or plastic flow. This forms a means to check from time to time the behavior of the structure, even after erection.

One of the newest developments is dynamic soil testing, whereby the propagation of waves in the elastic soil reveals any interruption in the sub-surface. Such oscillator tests may take the place of borings which at times are unreliable due to their arbitrary locations. With artificial vibration, continuous cross-sections of undisturbed soil covering a complete area has been determined for foundation purposes.

Tensile Tests of Cast Iron

In tensile testing of cast iron, it is important to know what effect the size, shape and surface defects of the test piece have on the final results. J. O. Draffin and W. L. Collins, University of Illinois, reported that they found variations in tensile strength of specimens poured from the same heat ranging up to 11 per cent, with the bottom of the casting stronger than the top by 7 to 8 per cent. Whether the specimens were solid or hollow made little difference, nor did threading on the outside or inside have any appreciable effect upon the strength values. Surface finish is not particularly important, as small superficial defects do not produce stress concentrations that effect strength. The greatest source of stress concentration the authors found to be due to an abrupt change of section. Studies of elongation revealed that the permanent set that occurs just before failure is 40 to 50 per cent of the total deformation at rupture.

CONTINENTAL CHAIN LINK FENCE

The only fence with fabric of *KONIK Steel—a stronger steel that is rust-resistant clear through. Continental galvanized—a heavy, uniform zinc coating. Furnished completely erected or material only. Send for new free Manual, "PLANNED PROTECTION."

CONTINENTAL STEEL CORP.

General Offices: Kokomo, Indiana
Plants at Canton, Kokomo, Indianapolis

FABRIC OF
**KONIK
STEEL**

CONTAINING COPPER, NICKEL, CHROMIUM FOR
GREATER STRENGTH AND RUST RESISTANCE
MFD. UNDER U. S. PATENT NUMBER 1574554

CONTINENTAL

STEEL SHEETS AND WIRE PRODUCTS

Wire: Bright Basic, Annealed, *Konik, Special Manufacturers, Galvanized, *Flame-Sealed
Wire Rods, Nails, Staples, Bale Ties, Barbed Wire, Fence—15 Types, Gates and Fittings
Sheets: Black, Galvanized, Special Coated, Roofing and Siding—14 Styles
*Trade Mark Registered, U. S. Patent Office

East River Tunnel Award is Made

CONTRACT No. 6, covering the construction of the Queens-East River tunnel in New York, was awarded to Walsh Construction Co., Long Island City, N. Y. Financed by Federal funds, the tube will require three and a half years to complete at a cost of \$58,000,000. The contract called for 3765 tons of steel shapes, 1643 tons of steel reinforcing bars, 37 tons of stainless steel shapes and bolts, and 34 tons of cast iron pipe. The tube lining will take 36,450 tons of cast iron segments, to be furnished by U. S. Pipe & Foundry Co., New York, under a previously awarded contract. Bethlehem Steel Corp. will supply 375,000 bolts and 750,000 washers required to bolt the lining segments together.

May Decline Shown In Steel Castings

ORDERS for commercial steel castings in May showed a decline of 31 per cent under those booked in April, according to the Department of Commerce. The May total was 68,688 net tons, compared with 99,672 tons in April and with 63,950 in May, 1936. The high point of the year for orders was reached in March, when 158,079 tons were booked.

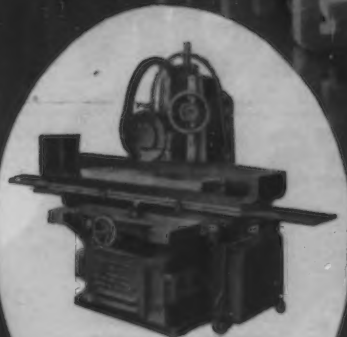
Production in May declined to a much lesser extent, output being placed at 95,995 net tons, compared with 105,475 in April and with 64,246 in May, 1936. The production peak, also reached in March, was 111,525 tons, when the industry was operating at 93.5 per cent of capacity. Operations in May were at 80.5 per cent, and a year ago at 53.9 per cent.

Farley Answers Republic's Suit

WASHINGTON, July 6.—Following up Republic Steel Corp's suit against the Post Office Department to compel delivery of food and clothing to strike-affected plants, Postmaster General James A. Farley on Thursday answered the corporation's demurrer which was filed June 25 in District Federal Court.

"The purpose of this writ (Republic's)," Farley said in a brief opposing the corporation's suit for mandamus, "is not to secure for the plaintiff a full, legal right, but with the object of provoking civil disorder and strife that would necessitate the use of armed Federal forces to restore order."

GRAND RAPIDS SURFACE GRINDERS

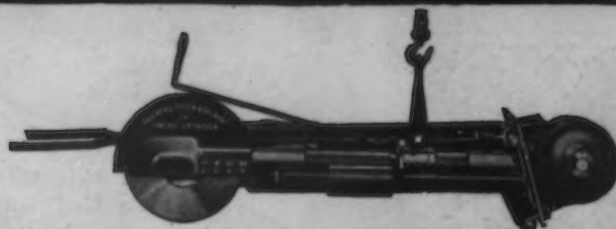


This is No. 65 in the series that covers every requirement. Write for Bulletin.

25 years experience is built into these high speed precision hydraulic feed surface grinders

GALLMEYER & LIVINGSTON CO.
310 STRAIGHT AVE., S.W. GRAND RAPIDS, MICHIGAN

MARSCHKE HEAVY DUTY GRINDERS AND BUFFERS



THIS illustration shows a MARSCHKE SWING FRAME GRINDER equipped with A.C. motor. It is made in sizes for 12" to 24" wheels. There is also a full line of Marschke Swing Frame Grinders with automatic constant cutting speed regulation for D.C. operation.

These machines are especially desirable for foundries, steel mills and other heavy industries—but Swing Frame Grinders represent only one division of 70 different types and sizes of Marschke Grinders and Buffers. There is a type and size of Marschke for your particular requirements.

A catalog showing all of these machines for wheels, ranging from 10" to 30", and motors from 1 to 25 H. P., will be sent promptly upon request.

VONNEGUT MOULDER CORP.
1807 Madison Avenue, Indianapolis, Ind.

Great Britain Reduces Import Duties on Steel; May Result in Larger Exports from United States

LONDON, July 7 (By Cable).—Effective July 7 to March 31, 1938, the Government has reduced

import duties on certain iron and steel products from cartel countries to 2½ per cent, and from non-cartel

countries to 12½ per cent. The material involved includes ingots, blooms, billets, slabs, joists, angles, shapes, bars, including sheets and tin plate bars, rods, plates, sheets, hoops, strips and rails.

There is a good demand for pig iron, but sellers are reluctant to accept new business. Hematite producers are releasing a limited tonnage for export under orders which were booked early this year.

Sheet makers are sold out for months ahead on their present limited supply of raw steel, but it is understood that arrangements are being made to increase Continental supplies of sheet and tin plate bars. Makers of heavy steel are heavily sold, delivery delays ranging up to six months.

The Continental steel market is quiet, though the Far East and South Africa are moderate buyers. Prices on most products are now down to the official rates, plus obligatory premiums.

Active tin plate business is limited only by the position of raw steel which is now expected to improve materially. Unfilled orders amount to 6,500,000 base boxes. The demand for black galvanized sheets is strong and makers expect an increase in orders when more raw steel arrives.

* * *

Steel Shortage Continues in Great Britain

London (Special Correspondence).—The reduction in import duties is aimed particularly at increasing imports from the United States. Under the cartel arrangements, the United Kingdom's import quota for the current year is 525,000 tons, but when it became apparent early in the year that an acute shortage was developing, the British Federation contracted for additional imports of around 100,000 tons.

Although cartel imports bore the reduced duty of 10 per cent, compared with 25 per cent and upward for other imports, the cartel countries are not anxious to sell even their contracted total to the British market because of the huge demand that has arisen in other countries. This demand is such that many foreign countries are willing to pay from £1 to £2 per ton more for their steel than the British internal price. Hence the apathy with which European manufacturers view the British demand.

While the obvious solution ap-

ARMSTRONG

Drop Forged WRENCHES

With 51 types always in stock . . . all millings, all sizes from tiny miniatures to great 2-man wrenches . . . there are standard ARMSTRONG WRENCHES readily available to meet any normal industrial requirement. And, for those special demands, calls for special wrenches and special millings, an ample stock of forged wrench blanks is maintained to assure delivery on short notice.

ARMSTRONG Wrenches are quality wrenches drop forged from special analysis steel, improved in designs, in proportions and balance. They are heat treated, hardened and finely finished in black baked enamel with heads ground bright and plainly marked for size. They are stronger, finer tools, still cost no more than other quality wrenches.

ARMSTRONG BROS. TOOL CO.

"The Tool Holder People"

309 N. Francisco Ave.

CHICAGO, U. S. A.

Eastern Warehouse & Sales: 199 Lafayette St., New York, N. Y.
San Francisco London

**51 STANDARD
TYPES with**

openings milled
for . . .

U. S. Standard
American Standard
S. A. E. Standard
Whitworth Standard
and Metric Standard



The Wells Metal Cutting Band Saw is the ideal unit for all-around cutting jobs. It cuts metal speedily in any shape with extreme accuracy. You can use it to advantage in any part of your plant or shop because of its versatility. Send for a folder and really learn what a Wells Band Saw can do for you.

No. 8 Size

8" diameter round or
8" x 16" flat

No. 5 Size

5" diameter round or
5" x 10" flat

**WELLS MANUFACTURING CORP. THREE RIVERS
MICHIGAN**

peared to be for British consumers to fulfil their requirements in America, this had so far proved impossible at economic prices, until the import duty was reduced.

The case for a reduction of the duty of American steel was succinctly put by H. Donald Hope, chairman of Henry Hope & Sons (manufacturers of steel windows, etc.), when he presided at the annual meeting in London recently. Mr. Hope said:

"We are being hit very hard by the shortage of steel and, owing to the inability of the English rolling mills to supply all our requirements, we have been obliged to place considerable orders with mills in the United States as a precaution against a partial closing of our factory. Our principal raw material consists of rolled steel sections, and, while the present arrangements with the Continental cartel provide for an import duty under quota certificates of 10 per cent, steel from the United States has to pay 33 1/3 per cent duty. Only a very small quantity can be obtained from the Continent, and this is insufficient to meet our needs. In these circumstances it does seem an injustice that in addition to paying 5s. income tax, plus the new defense tax, we should have to pay some thousands of pounds in extra duty on steel from the United States, which we have been obliged to buy in order to keep our men employed. I suggest there is something wrong in these arrangements for the protection of steel in Great Britain which compel a firm like ourselves, who have always bought our supplies from British mills, to pay so heavy a duty as 33 1/3 per cent on the only material available."

Another big concern which is suffering acutely from the shortage, Fisher & Ludlow, of Birmingham, placed its case before Parliament. This company, which employs 3000 men and is a large manufacturer of automobile stampings, first began to feel the effect of the steel famine last fall and since then its position has become steadily worse. As a result it has not been able to quote for new business and, at the time of writing, it has just had to stop some of its departments altogether for two days.

In fact, a growing number of British manufacturers of steel goods have been suffering from the effects of the restrictions on imports of steel into the United Kingdom. As a result there was an insistent demand that the high import duty on steel sheets be reduced. New plants being put up in various parts of Britain will not come into production for some time, and existing plants are working to capacity. The

position has been aggravated by the failure of the European countries in the steel cartel to export their full quotas to the United Kingdom.

Leaders in the industry point out that the shortage of steel sheets will be reduced in another year or so when the new Ebbw Vale plant and the new Sheffield plant of John Summers start production. For this reason the British industry is likely to press that any measures

taken to relieve the present scarcity should be of a purely temporary nature. At the same time, there is no doubt that any plan which will enable consumers to get all the steel they require will be welcomed, especially by automobile manufacturers.

Westinghouse Electric & Mfg. Co. announces a price increase on all mechanical drive turbines effective July 6, 1937.

PERFORATED METAL

*Any metal
Any perforation*

**The
H & K Line**

embraces a wide range of sizes and shapes for industrial uses and includes many beautiful and exclusive patterns for decorative purposes.

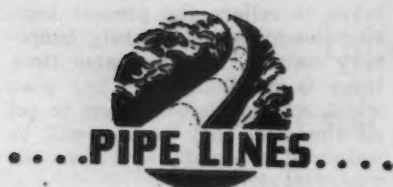
**The
Harrington & King
PERFORATING CO.**

5657 FILLMORE ST., CHICAGO - 114 LIBERTY ST., NEW YORK

NOTHING ON OUR MINDS BUT—

SPRINGS

DUNBAR BROS. CO.
DIVISION OF ASSOCIATED SPRING CORPORATION BRISTOL CONNECTICUT



McClanahan-Leonard Pipe Line Co., Inc., Mount Pleasant, Mich., recently organized with capital of \$500,000 to take over McClanahan Pipe Line Co. and Leonard Pipe Line Co., both Mount Pleasant, plans new welded steel pipe lines from oil field district in Buckeye Township, Gladwin County, to St. Louis and Alma, Mich., respectively, for crude oil

transmission to oil refineries of McClanahan and Leonard companies, in order noted, operated under name of McClanahan Oil Co. and Leonard Oil Co., affiliated interests. Project will include pumping stations at points along routes. New company also plans other welded steel pipe lines for extensions in McClanahan and Leonard pipe lines in different areas; it will take over all such properties, with exception of McClanahan pipe lines in Arenac County. Walter L. McClanahan is chairman of board; J. W. Leonard, Jr., is president; and Theodore Russell, general superintendent.

Arizona Light & Power Co., Phoenix, Ariz., plans steel pipe lines for extensions in system from Indian School Road to Brophy College area for gas transmission to latter point. Cost close to \$30,000. John F. Quinn is district manager in charge.

Humble Oil & Refining Co., Houston, Tex., plans welded steel pipe line in Dickinson oil field, Galveston County, for natural gas transmission for new casing-head gasoline plant to be located in that area. New plant will require about 25,000,000 cu. ft. of gas per day.

Godfrey L. Cabot, Inc., Olean, N. Y., and 77 Franklin Street, Boston, operating natural gas properties, carbon black plants, etc., plans steel pipe lines for natural gas transmission in gas field near Sabinsville, Tioga County, Pa., where development program will be carried out. New Lines will connect with present pipe line system of company in Pennsylvania and western New York districts.

Shell Petroleum Co., has placed contract with A. O. Smith Corp., Milwaukee, for 75 miles of 10-in. welded steel pipe for line from Oklahoma field to southern Missouri, requiring about 8000 tons of plates.

Dominion Gas Co., St. Thomas, Ont., plans extensions in pipe lines for gas distribution, including replacement of several existing 4-in. lines with 6-in. mains. Cost over \$35,000.

Pacific Gas & Electric Co., 445 Sutter Street, San Francisco, has secured permission to build new welded steel pipe lines from recently opened Rio Vista gas field, Solano County, Cal., to Woodland, Cal., and vicinity. Cost about \$900,000 with booster stations and control plant at new mill of Spreckels Sugar Co., Woodland, where natural gas will be furnished.

Oakland, Cal., will open bids July 14 on 9000 ft. of 30-in. cement lined steel pipe.

Phillipsburg, Mont., has opened bids on 8½ miles of pipe for a water system.



Board of Awards, Baltimore, has let contract to Merritt-Chapman & McLean Corp., Fidelity Building, for 3-in. water pipe line under Curtis Bay at \$153,700.

Asheboro, N. C., plans pipe lines for water system and other waterworks installation. Cost about \$37,500. Financing has been arranged through Federal aid. W. M. Platt, Durham, N. C., is consulting engineer.

London, Ky., plans about 6925 ft. of 6-in. and 1825 ft. of 4-in. for extensions and replacements in water system.

Port Tampa, Fla., plans water pipe lines in a number of county roads near town limits. Work will be carried out in connection with a PWA water project in this district to cost about \$140,000. A. T. Rollins, mayor, is active in project.

Kilmichael, Miss., plans pipe lines for water system and other waterworks installation. Cost about \$30,000. Financing is being arranged through Federal aid. W. E. Mallett, Jr., Jackson, Miss., is consulting engineer.

Hidalgo County Water Control and Improvement District No. 3, McAllen, Tex., plans 21,270 ft. for water system. Fund of \$51,000 is being arranged for this and other equipment, of which \$20,000 has been secured through Federal aid.

Tulsa, Okla., will ask bids soon for about 8000 ft. of 6-in. for extensions in water system. W. F. Graham is water commissioner in charge.

Oxfordville, Wis., plans pipe lines for water system and other waterworks installation. A sewage plant also will be installed. Entire project will cost close

IT WAS BALANCE— NOT LUCK!

A Typical Chapter in the Daily History of Wyandotte Metal Cleaners

¶ A Metal cleaning operation for quantity production is "tuned up" to the peak of efficiency, Wyandotte cleaning solutions and the time allowances being well balanced. The finishing department is the pride of the department superintendents.

¶ Such smooth running efficiency isn't luck. The same operating skill and effort which produces these profitable results with Wyandotte Metal Cleaners would be thrown out of balance, with periodic confusion and losses, but for the exceptional uniformity of Wyandotte Quality. The balance is maintained.

¶ Our field organization for personal service has been termed by customers, a "National clearing house of industrial cleaning experience." Always at your service.

May We Co-operate With You?



THE J. B. FORD COMPANY WYANDOTTE, MICH.

to \$60,000. W. G. Kirchoffer, Madison, Wis., is consulting engineer.

Milwaukee closes bids July 15 (C. P. No. 42) on 250 tons of 8-in. and 250 tons of 12-in. class C water pipe and 13 tons of special castings.

Stephenson, Mich., will hold special election July 14 on \$25,000 bond issue toward WPA loan and grant for waterworks and sewerage system costing \$80,000, to include 4400-lin. ft. of various sized mains.

Cloquet, Minn., has plans for extensions in water system; also for remodeling and improving pumping plant. Bond issue of \$50,000 has been authorized. John Wilson, Torrey Building, Duluth, Minn., is consulting engineer.

Afton, Wyo., plans extensions and replacements in water system. Cost about \$30,000. Special election has been called July 12 to approve bond issue in amount noted. E. M. Barrus, mayor, is head of project.

Craig, Colo., plans pipe lines for extensions in water system; also new lines for sewer system. Entire project will cost about \$30,000. Financing is being arranged.

Tucumcari, N. M., plans extensions and improvements in water system. Fund of \$33,000 is being arranged for this and other waterworks installation.

Safford, Ariz., has opened bids on 2500 tons of various sizes for a municipal water system.

San Francisco has awarded 500 tons of 4, 8 and 16-in. to United States Pipe & Foundry Co., and 320 tons of 6-in. to Central Foundry Co.

South Pasadena, Cal., has authorized pipe lines for water system in district bounded by Mission and Pine Streets, Garfield Avenue and Huntington Drive, totaling about 19,625 ft. of pipe. Cost about \$62,246, of which \$26,352 is being secured through Federal aid. Frank Clough is city engineer in charge.

RAILROAD BUYING

Chicago & North Western is inquiring for 50 underframes for caboose cars.

Illinois Central is inquiring for 25 50-ton hopper cars.

Milwaukee Road has been authorized to purchase 1000 gondola cars and one locomotive.

Minneapolis, St. Paul & Sault Ste. Marie is inquiring for 100 50-ton box cars.

Newburgh & South Shore is inquiring for two 0-6-0 type locomotives.

Great Northern is contemplating purchase of two diesel-electric locomotives.

Board of Transportation, City of New York, will ask for bids soon on 150 passenger cars for subway service.

New York Central is asking for bids until July 9 on six dining cars and four baggage-mail cars.

Missouri Pacific plans to buy six electric locomotives and 2225 freight cars following approval of its application to issue equipment trust certificates amounting to \$4,260,000. Total cost of this equipment will be \$5,694,928.

Southern Pacific has ordered two tavern and two coffee cars from Pullman Standard Car Mfg. Co.

RAILS AND TRACK SUPPLIES

Brazilian Railways have placed an order with Carnegie-Illinois Steel Corp. for 17,000 tons of standard rails and 800 tons of track accessories.

Carrier Corp. Buys Franklin Auto Plant

THE Carrier Corp., Newark, N. J., manufacturer of air conditioning equipment, has purchased the former Franklin automobile plant at Syracuse, N. Y., which was sold at public auction by the city of Syracuse for unpaid taxes. The plant has about 1,500,000 sq. ft. of manufacturing floor space. About 80 per

cent of Carrier's administrative and production operations will be moved to Syracuse within a year.

L. R. Boulware, vice-president and general manager of Carrier, states that the company has enjoyed about twice the volume of business it had in the early part of 1936. The company has five factories, which have been taxed to capacity to provide for the phenomenal increase in purchases of air conditioning equipment.

Specify

"A.W." ROLLED STEEL FLOOR PLATE

for Safety!


"A.W." Standard Diamond Pattern



"A.W." Super Diamond Pattern



"A.W." Diamondette Pattern



The three patterns are here shown half size.

Safety for Busy Workers

is the principal result you gain from any "A.W." Rolled Steel Floor Plate pattern you install. But here are others:

You gain a **PERMANENT** installation at amazingly low first cost—and you eliminate all upkeep cost. Installation is quick, and need not interfere with men or production. Cut to any required shape and easily matched. As readily applicable to new construction as to replacement or repair work. A sanitary flooring which drains quickly—which is heat proof, crack proof, oil proof.

Write for newly revised literature—just issued—showing five "A.W." Floor Plate patterns to meet all needs, and giving complete engineering data.

ALAN WOOD STEEL CO.

CONSHOHOCKEN, PA.

Branches: Philadelphia, New York, Boston, Detroit, Los Angeles, San Francisco, Seattle, Houston

111 YEARS' IRON AND STEEL MAKING EXPERIENCE

Portland Cement Binder For Foundry Molding Sand

(CONTINUED FROM PAGE 37)

obtained far more simply and more certainly, as well as more cheaply by using the high-grade facing exclusively for each mold. As already

suggested, it was this concept which led to the procedure followed in these studies, and adherence to it should enhance the possibility

for successful application of the results to foundry practice.

Mr. Menzel made the following recommendations as a guide for the use of cement binder:

For the facing of the mold only fresh, clean, well-graded silica foundry sand should be used. The sand should be mixed with about 10 per cent cement and a total of 4½ per cent of water by weight of the dry materials. This damp mixture should be rammed in the usual manner and to the proper thickness. It can be backed up with a mixture composed of cement and a lower grade of sand or other material. Such a facing mixture, when made with high-early-strength portland cement and protected from loss of moisture for the first 24 hr., will have excellent strength and permeability for foundry purposes two or three days after molding, even though dried rapidly following the initial 24-hr. moist period. If normal portland cement is used, the green strength will be lower and a longer curing period and greater age will be necessary to obtain the same set strength. Increasing the amount of normal portland cement would give adequate strength but would bring about an undesirable decrease in permeability and increase the lime constituents at the surface of the mold.

The facing mixture may be mixed and rammed in the usual manner but extended mulling should be avoided in order to reduce temperature rise and moisture loss. Mixtures at normal temperatures of 70 to 80 deg. F., should be rammed within 2½ hr. after mixing if made with high-early-strength cement, and within 4 hr. if made with normal portland cement. Mixtures at higher temperatures, say 100 to 110 deg. F. should be rammed as soon as possible after mixing but not later than 1 hr.

Conveyors Motivate Continuous Flow Principle

(CONTINUED FROM PAGE 45)

of apparatus in the processing equipment at a uniform rate of 600 cases an hour.

This bottling plant layout represents a simple manufacturing prob-

Step up Sawing Speeds, Feeds and Blade Tension

Don't baby your
hack saw machine
—get all you
can out of it.

Tough
Alloy
Body

MARVEL
High-Speed Edge
Hack Saw Blades

Strictly High-Speed, these patented combination blades are also *positively unbreakable*. They permit greatly increased running speeds, for heavier feed pressures, and can be tensioned much tighter than other blades because the hardened "eyes" in their tough alloy steel body will not pull out.

No matter what hack saw equipment you use, you can safely run at full capacity with MARVEL High-Speed-Edge Blades.

Write for Circular

ARMSTRONG-BLUM MFG. CO.

"The Hack Saw People"
5849 Bloomingdale Ave.

Chicago

U. S. A.

High
Speed
Edge



HAVE YOU A CLUTCH PROBLEM?

—One where synchronization, remote control, operating safety and dependability are demanded?

There isn't any better solution than a Dings Magnetic Clutch.

Dings Magnetic Clutches will answer your demands for strength, quick action and long life.

There is a size for every problem. Let us tell you what we can do.

Dings
High Intensity
**MAGNETIC
CLUTCHES**

DINGS MAGNETIC SEPARATOR CO.
727 Smith St., Milwaukee, Wis.

Since 1899 Dings engineers have been building magnetic equipment. Here is experience that no other manufacturers of this type of equipment can offer. Such experience has a real dollars and cents value to you.

lem. To function at all economically, continuous-flow methods had to be adopted. The making of a complicated piece of apparatus such as a domestic electric refrigerator in several sizes and models, requiring many different types of operations on different parts, plus an assembly and final finishing operations, is a problem of quite different caliber. In Fig. 2 there is shown a drawing of the relatively simple solution of an extremely complicated problem of this nature; rendered even more complex by the fact that the product as then manufactured was made and assembled in parts of buildings of a large plant mainly devoted to the manufacture of quite different lines. This drawing shows the layout of an interdepartmental Webb - Lamson materials handling conveyor, coordinating the manufacture, assembly and finishing of the General Electric refrigerators at the Schenectady works of General Electric Co. in 1930-31. Here the main purpose of this conveyor system was the tying together of production operations by expediting the movement of materials and parts from process to process, to fit an existing layout of operations at that time scattered through several buildings.

Consideration of these two drawings reveals clearly the importance of the factor of coordination of production; first in the unit plant with a simple process, and second in a scattered, multi-building plant with a very complicated process of manufacture. In between these two extremes lie all sorts and conditions of manufacturing problems, in which production economy hinges directly on the salient principle of a continuous flow of materials and parts to and from various machines. It is a significant fact that in the study and solution of so many of these problems, conveying equipment of one kind or another plays a dominant role. There are three basic reasons for this:

1. The force of gravity may be employed for at least 75 per cent of all movement of materials or parts by conveyors, the balance of conveyor-moving being performed by power driven equipment which uses relatively small amounts of power. Operating costs are consequently low.

2. Conveyor systems may be designed which will move materials or parts continuously along horizontal, inclined, or vertical planes. There are practically no limitations to the range of movements.

3. Materials or parts may be put onto or taken off conveyors at any desired station without affecting the general flow, and all other types of mechanical handling equipment may be readily keyed into a con-



NATURAL LAW IN STEEL PRODUCTION

CONTINUOUS flow principles are the law of gravitation in the steel industry. From the moment that the mechanical blower superseded the bellows, and the rolling mill the forging hammer, and from the moment that the open hearth and continuous charging came into use, all production processes in the steel industry have tended inevitably to the maximum application of the Continuous Flow Principle of Handling Materials.

Mathews engineers realize the problem of handling materials in Steel Mills is bigger than merely conveying larger loads at higher speed. So, from the very first, Mathews equipment has been engineered to facilitate the logical sequence in the operations of the mill, from furnace to storage and shipping.

Mathews engineers are steeped in modern steel mill operation. Their thinking can be likened to that of steel men responsible for the handling of the product.

Processing Equipment installed during 1936-37, embracing the ultimate in design and engineering in the Steel Industry, is illustrated and described in our catalog on Steel Plant Conveyers. Available now.

The leaders in this industry, responsible for 85% of steel production in the United States and Canada, are applying the Continuous Flow Principle of Handling Materials.

MATHEWS CONVEYER COMPANY 114 TENTH STREET
ELLWOOD CITY, PENNA.

MATHEWS

CONTINUOUS FLOW PRINCIPLE OF HANDLING MATERIALS

CONVEYERS

veyor system at any point of the flow-line without changing the design or location of the conveyors.

In brief, a conveyor system, properly designed and utilized, is the closest approach to a "universal" system of materials handling afforded by any type of mechanical handling equipment, for a majority of situations. The major limitation is one of lack of flexibility, in the sense that a conveyor requires a fixed installation, and cannot readily be used for odd jobs in unusual locations, like an indus-

trial truck. Essentially, a conveyor system is a piece of mass production equipment; performing best that type of work which requires continuous movement of like goods in one direction only.

Intercommunication

The example of the G. E. refrigerator shows how conveyor systems may form the means of intercommunication between several buildings, with respect to movements of materials. Possibly one of the most impressive examples of a convey-

ing system installed to overcome the handicap of sheer size of plant is to be found in the National Cash Register Co. at Dayton, Ohio. Twenty-two separate production buildings are tied together with various conveyor systems.

Of these systems the most interesting is that which comprises a number of lines radiating from a central switching tower in one building, to tie together the various floors of four buildings in the heart of the plant. At this central switch tower all the lines come together in such a way that a tote box of parts may be sent from any point on any of the lines, with the destination marked, and on arriving at the switch tower may be routed instantly over any other line so that it will automatically reach its proper goal. This switch tower serves the conveying system like the central switchboard of a telephone system. Coordination is practically perfect, and as a result, savings are large. Stock is delivered quickly and uniformly wherever needed, floor congestion is reduced, stocks of partly finished and finished materials held in semi-storage are lessened, workmen have the incentive of seeing stock continuously on the move, and the advantages of straight-line production are obtained even though successive operations may be located in different departments or even in different buildings. Automatic loading and unloading stations make possible the loading and unloading of the conveyors with a minimum of time and effort expended.

Equipment Illustrated

Many of the foregoing statements will be made clearer upon inspection of the accompanying illustrations.

Trays of bearing balls come from a finishing process on a Mathews gravity roller conveyor in Fig. 3 to a scale section for weighing, thence are elevated by an automatic lift to another Mathews gravity roller conveyor at a high level, and travel along it to an assembly room. The only power required to move these trays is that taken by the automatic lift.

In the same plant, Fig. 4 shows bearing races passing through a heat-treating furnace on a Mathews traveling metal screen conveyor and then being automatically diverted into the various bins at the inspection tables. Here a small geared-head motor furnishes the power to keep the line moving continuously.

Fig. 5 shows a Standard Conveyor gravity roller spiral chute, taking cases of beer from a gravity

THE NATION'S BUSINESS MOVES ON MORSE *Positive* DRIVES...



"GIVE US MORE EFFICIENCY in power transmission," says American industry. "More production at lower costs. Fewer breakdowns. Less idle time. Better control of production operations. In short, give us Morse Positive Drives."

No other form of drive provides the smooth, positive action of Morse Silent Chains. Teeth, not tension, turn the wheels. Useful life is long—first cost lower than you think. Morse Positive Drives are the easiest drives to install. Write or call for further interesting data.

MORSE CHAIN CO., Ithaca, N.Y.

Offices in Principal Cities
Division Borg-Warner Corporation

*The TREND IS
TO MORSE
Positive DRIVES*

SILENT CHAINS ROLLER CHAINS FLEXIBLE COUPLINGS KELPO CLUTCHES

MORSE *positive* DRIVES

MORSE CHAIN COMPANY ITHACA N. Y. DIVISION BORG-WARNER CORP.

roller conveyor on the upper floor and delivering them to a movable gravity roller conveyor on the shipping floor.

Fig. 6 shows a Chain Belt power driven slat conveyor installed flush with the floor in a wholesale grocery warehouse shipping room. Packed boxes come from the upper floor down the inclined chute onto this moving section of the floor, where other packages join the procession to the waiting delivery trucks outside.

Fig. 7 shows a Standard Conveyor installation in a box-making shop—three lines of gravity roller conveyor discharging through a common switch onto a single gravity roller discharge line.

Fig. 8 shows a Mathews inclined trough-shaped roller conveyor terminating in a slatted chute-stop for the handling of rolls of paper from a storage loft to a box-making room.

Fig. 9 is an illustration of a full-powered radial switch as made by Standard Conveyor Co., which permits intermediate discharge of commodities at any one of several points, onto branch line conveyors, without any manual effort other than pressing a push button. Many commodities cannot be diverted from power belt, live roller or slat conveyors because of their weight or the construction of the carrying surfaces. Such a switch as this will accomplish the desired purpose instantly, and then return automatically to the normal running position without any further attention on the part of the operator.

(Succeeding articles on conveyor methods will treat in detail heavy duty roller and slat conveyors, belt conveyors, scraper and bucket elevators and skip hoists, and of screw conveyors and pneumatic tube systems.)

Introduces New Acid-Resisting Alloy

FOR use under extremely severe conditions of corrosion, the Haynes Stellite Co., Kokomo, Ind., is offering a new alloy known as "Hastelloy B," produced primarily for service in equipment handling hydrochloric acid in all concentrations and at temperatures up to and including the boiling point. It is said also to stand up well in sulphuric and phosphoric acids, acetic and other organic acids, and in non-oxidizing acid chloride solutions. In 20 per cent hydrochloric acid at the boiling point the rate of

penetration of the solution is only 0.0016 in. per month.

The new alloy is composed of nickel, molybdenum and iron. In this respect it is similar to "Hastelloy A," except that the proportion of iron has been decreased and the molybdenum content increased, giving a higher ultimate tensile strength and higher yield point, with practically no loss in ductility or in reduction of area. The physical properties of Hastelloy B are comparable to those of a good grade

of alloy steel—the tensile strength in the forged, rolled and fully annealed state being about 135,000 to 140,000 lbs. per sq. in. with an elongation of 44 per cent in 2 in.

A number of different forms of the new alloy, including castings, wrought parts, rolled plate and sheet, wire and welded tubing, is available. Applications include agitator units, heating and cooling coils, pumps and pump parts, condensers, pickling tanks, valves, pipe and fittings.



Safety for the Brakemen

Neither the gauge, size nor specifications of a stamping presents any obstacle to Parish. Skill, experience and equipment combine to make difficult stampings comparatively easy in Parish shops.

This non-skid brake step for box cars is 1/4" thick x 30" long x 10" wide. The flange is 1". Embossing around the holes makes the step non-skid. Another of the many types of stampings produced by Parish for many industries.

Have you a problem that could be worked out in pressed metal? Our engineers will do it for you.

PARISH PRESSED STEEL CO., Reading, Pa.

PACIFIC COAST REPRESENTATIVE
F. Somers Peterson Co., 57 California St., San Francisco, Calif.



AWARDS

Gloucester, R. I., 200 tons, State road, to Concrete Steel Co.

New York, 150 tons, Swift & Co. market building, to Bethlehem Steel Co.

Queens, N. Y., 135 tons, World's Fair exhibit building, to Capitol Steel Co., New York.

Ulster County, N. Y., 450 tons, mesh for highway, to American Steel & Wire Co.

Buffalo, 225 tons, Buffalo Sewer Authority, sludge disposal building, to Buffalo Steel Co.

Cheektowaga, N. Y., 110 tons, Scjaquada Creek improvement, to Igoe Brothers, Inc.

Philadelphia, 100 tons, Adam Scheidt Brewing Co., to Truscon Steel Co.

Cincinnati, 224 tons, Laurel-homes project, to Pollak Steel Co.

Detroit, 320 tons, Parkside housing project, to Inland Steel Co.

Phoenix, Ariz., 675 tons, Bureau of Reclamation, to Colorado Fuel & Iron Co.

Peoria, Ill., 150 tons, Hiram Walker building, to Bethlehem Steel Co.

St. Paul, Minn., 160 tons, Eagan Chevrolet Camp Building, to Paper-Calmenson Co.

Waterloo, Iowa, 160 tons, post office and court house, to Truscon Steel Co.

Hot Springs, S. D., 125 tons, Veterans' hospital, to Sheffield Steel Corp.

State of North Dakota, 180 tons, Fargo-Moorhead bridge, to Bethlehem Steel Co.

Fresno, Cal., 290 tons, Bureau of Reclamation, to Northwest Steel Co.

San Francisco, 3200 tons, railway terminal for San Francisco-Oakland Bay bridge, to Truscon Steel Co.

Casper, Wyo., 118 tons, Casper-Alcova project, to Sheffield Steel Co.

Potholes, Cal., 495 tons, All-American Canal project; 100 tons to Judson-Pacific Steel Co., 395 tons to Colorado Fuel & Iron Co.

NEW REINFORCING BAR PROJECTS

Belchertown, Mass., 177 tons, State water project.

Palmer, Mass., 180 tons, Ware River bridge.

New York, 1645 tons, including 245 tons of wire mesh, Queens-East River Tunnel; Walsh Construction Co., Long Island City, N. Y., contractor.

Perth Amboy, N. J., 300 tons, highway by-pass; Camillo Contracting Co., low bidder.

Westchester County, N. Y., 225 tons, bridge.

Pittsburgh, approximately 1000 tons, Banksville Road.

Norfolk, Va., 515 tons, railroad overpass; bids this week.

Dayton, Ohio, 100 tons, Rike-Kumler Co. store.

Kingfisher County, Okla., 200 tons, highway bridge.

Yuma, Ariz., 915 tons, All-American Canal project; V. R. Dennis, low bidder on general contract.

Casper, Wyo., 110 tons, Casper-Alcova project; bids opened.

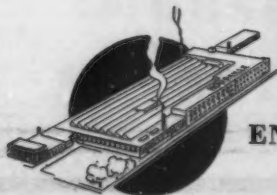
Austin, Tex., 500 tons, Colorado River project; bids opened.

Mexie City, Wash., 218 tons, Yakima-Rosa project; bids opened.

Continental Can Co., New York, has announced that its business will be further diversified through the manufacture and sale of crown caps or seals for bottles and cap sealed cans. O. C. Huffman, president, says initial orders have been placed for some of the equipment to be used, although a considerable portion of the machinery required is being developed in the company's own machine shops.

Richard Thomas, Ltd., Ebbw Vale, Wales, has purchased the first installation of Kemp immersion heating for a tin mill in Wales. This is in connection with their new continuous strip mill and tin house which is being built under the direction of the United Engineering & Foundry Co. of Pittsburgh.

IT may be only a simple piston pin; it may be a refrigerator compression pump; it may be a gun barrel; it may be any one of a thousand-and-one parts or complete mechanisms requiring utmost accuracy, yet *low production costs*. Whatever it is, the chances are Houdaille's highly specialized machinery, specially trained men and common-sense engineers can turn it out to better advantage than your own facilities permit.



HOUDE

ENGINEERING CORPORATION

BUFFALO, N. Y.

A DIVISION OF HOUDAILLE-HERSHEY CORPORATION

STOP THE LEAKAGE THAT WASTES AIR AND RUNS UP COSTS

Hannifin Disc-type Air Control Valves have no packing, and no leakage or packing maintenance troubles. The disc and seat are ground and lapped to make a perfect seal. Easy re-lapping at long intervals maintains most efficient valve performance.

Made in 3-way and 4-way types, hand, foot operated, spring return, heavy duty rotary, manifold, and electric models, for positive control of air or hydraulic equipment. Write for Valve Bulletin 34-A.

HANNIFIN MANUFACTURING COMPANY
621-631 South Kolmar Avenue, Chicago, Illinois

ENGINEERS • DESIGNERS • MANUFACTURERS • Pneumatic and Hydraulic Production Tool Equipment

HANNIFIN "Packless" VALVES

AIR CONTROL



Cleveland Steel Plants Reopen Peaceably; Strike at Youngstown Also is Broken

CLEVELAND, July 7. — Republic Steel Corp. announced today it will reopen Steel & Tubes, Inc., tomorrow morning, after three strike-closed Cleveland plants had reopened their gates to returning workers yesterday morning. The Corrigan-McKinney plant went on a 24-hr. shift as approximately 850 men remained at work all night to expedite the task of getting the huge plant back in full operation. Truscon Steel Co. and the Upson division remain temporarily on a one-shift basis. Corrigan-McKinney started up another open hearth today, making seven active out of a total of 14. Two of its four blast furnaces are now making iron, including the largest stack.

As a rapidly growing army of employees filed past military outposts into the mills without molestation from pickets, the 40-day old steel strike was seen definitely to have been broken. All told, approximately 3087 workers reentered the Republic mills between 7 a. m., when the gates were thrown open and 12 noon yesterday. Orderliness was insured by the presence of about 1500 National Guardsmen and heavy details of local police. The troops, sent here by order of Governor Davey of Ohio, were deployed along so-called "danger zones" surrounding the strike area. In close cooperation with local law-enforcing bodies, they took over picket lines, manned entrances to the plants, and otherwise took steps to guarantee preservation of law and order.

By proclamation of the sheriff, picket lines were specifically limited to 12 men at each gate, and a further precaution was taken in that returning workers were made to produce credentials of identification issued them by the steel company to insure that only regular employees should enter the mills. Union forces made no effort to prevent non-strikers from going back to work, but disputed claims that more than a minority of men reentered the plants.

Authentic information was obtained from company heads, however, to show that by noon yesterday 524 men out of 700 normally employed had returned to work in the Truscon Steel division, and 875 out of a normal force of 1100 had reentered the Upson division. At the large Corrigan-McKinney works 1688 men were put back to

work out of normal employment of 3200, but 800 additional employees reported and were told not to return immediately.

Coke ovens at this plant were immediately placed in operation,

and a first batch of coke was turned out yesterday at 10:40 a. m. The refring of six out of the plant's total of 14 open-hearth steel furnaces was started. Schedules called for the blowing in of a blast

TOOL STEEL — for — 50 years

NEW YORK

745 Washington Street
Tel. CHelsea 3-5315
Teletypewriter NY-1-146

BOSTON

915 Oliver Bldg.
Tel. HANcock 4990
Teletypewriter BOS-270

There's a
distributor
near you.

There is no virtue
in age alone, but 50 years'
experience in providing the
right steel at the right time
is a phase of Milne service
that thousands of customers
have found extraordinarily
helpful. Write for our
current catalog.

BRANCH OFFICES AND WAREHOUSES

CHICAGO

17 W. May Street
Tel. MONroe 2000

DETROIT

915 Harper Ave.
Tel. MADison 1170-1171

PITTSBURGH

604 Frick Bldg.
Tel. ATLantic 2171

NEW ORLEANS

611 South Peters Street
Tel. RAYmond 0011

A. MILNE & CO.

1887 — FIFTY YEARS OF FRIENDLY SERVICE — 1937



Model "UL" Gusher Pump
with Polyphase Motor.

A "GUSHER" COOLANT PUMP

on any metal cutting machine produces a free, uninterrupted controlled flow of coolant without priming, and with minimum attention.

Ruthman pumps are standard on many machines—see that they are on yours.

Complete data sheets on request

THE RUTHMAN MACHINERY COMPANY
537 EAST FRONT ST., CINCINNATI, OHIO

furnace yesterday and another today. The one blown in yesterday is the new 1000-ton furnace. The remaining three are of 500-ton size, and, in addition to placing one of these in operation today, it is expected to get the others going as soon as possible.

Meanwhile, refrigerator cabinets began to move off the line at the Truscon fabricating plant, and men were busily engaged making bolts and rivets in the Upton

plant. Long idle machinery again began to turn, and railroad cars moved in and out of plant yards carrying materials and supplies.

There was no sign of disorder or attempts by strikers and sympathizers to interfere with the resumption of peaceful operations. Adequate military protection afforded by the Governor's troops, and the determination of local law enforcement officials to keep this community free of violence were

sufficient to command the respect of those who might have been otherwise inclined to attempt a breach of lawful conduct.

Veiled threats, however, were heard from picket lines as to what would happen to non-strikers after they left work to return to their homes. Most of the returning workers used automobiles today to get to their jobs. The Corrigan-McKinney plant was placed on a 12-hr. shift for the time being. Temporarily only one shift is to be used at the Truscon plant.

With strike news from the Mahoning Valley area indicating further progress this week toward resumption of full operations, it is expected to be only a matter of time before all difficulties are solved. Operations of the Youngstown Sheet & Tube Co. in the Youngstown district have climbed virtually back to normal. That company's Campbell works are now operating 10 out of 12 open-hearth steel units, and 10 furnaces out of 12 at its Brier Hill works also are going. In addition, one Bessemer unit at Campbell is back in use. All rolling mill departments of Sheet & Tube are again operating.

Work at the Youngstown plant of Republic Steel Corp has largely returned to normal volume, although at Canton and Massillon mill operations are still below normal. The corporation's Warren works is practically on a full-work schedule.

Republic's Buffalo Plant Fully Manned

BUFFALO, July 6.—Two hundred employees have been reinstated at the plant of the Republic Steel Corp. These were men who had either been on strike or had remained away from work because of fear. They received their jobs back after a vote had been taken among the members of their respective departments.

"As far as we are concerned," said Martin H. Stearns, management representative, "there never has been a strike. However, we were handicapped by lack of manpower because some of our employees stayed away from their jobs for fear of reprisals. This phase is definitely past and we have many more applications than jobs to be filled."

Maintaining that the strike is not over, Elmer F. Cope, CIO organizer, charged that the company merely is putting on a show to make it appear that many are going back to work.



HYDRAULIC CYLINDERS

We Make Both



AIR CYLINDERS

T-J NON-ROTATING DOUBLE ACTING CYLINDERS

are available in seven standard styles. Non-cushioned, Cushioned on both ends, or either end.

THE TOMKINS-JOHNSON CO.

628 N. Mechanic Street, Jackson, Michigan

Oliver

BOLTS...NUTS...

RIVETS



THE TIME-TESTED PRODUCTS OF ONE OF AMERICA'S OLDEST BOLT & NUT MANUFACTURERS

OLIVER IRON AND STEEL CORPORATION
PITTSBURGH, PENNA.

Cambria Plant Back to Normal Rate; SWOC Asks Election by Labor Board

PITTSBURGH, June 7.—Operations at Bethlehem Steel Co.'s Cambria works, Johnstown, Pa., are back to normal. With close to 11,000 employees out of 15,000 having returned to work, it is apparent that the strike sponsored by Steel Workers Organizing Committee has been broken.

Union leaders had predicted a gathering of 40,000 or more at a mass meeting held at Johnstown last Sunday, but not more than 12,000 sympathizers turned out. The principal speaker was Governor Earle, of Pennsylvania, who warned that labor must stamp communists out of its ranks if it is to gain public sentiment. The State has stepped back into the strike situation

through a promise of the Governor to have his Attorney General confer with the U. S. Attorney General to "See if Bethlehem can be forced to hold an election for its workers, either under the Wagner Act or under Pennsylvania's 'Little Wagner Act.' The SWOC has already petitioned the National Labor Relations Board for a company-wide election at Bethlehem Steel Co.'s and Weirton Steel Co.'s plants."

Throughout the strike at Johnstown, which was marked by sporadic outbursts of violence, the major one of which was the dynamiting of the company's water mains, the sympathies of the majority of workmen, business people and citizens, were against the strike.

Inland Steel at Capacity Operations But Sheet & Tube Plant is Still Idle

CHICAGO, July 7.—A conference in Indianapolis yesterday between Governor Townsend of Indiana and representatives of the Youngstown Sheet & Tube Co. and the SWOC, which was expected to bring about a reopening of the Sheet & Tube mills at Indiana Harbor, broke up without results. At the moment there is no definite indication as to when work will be resumed at the plant unless Indiana's Governor promises protection to workers who desire to return to their jobs.

The neighboring plant of the Inland Steel Co., which resumed operations July 1, is operating at capacity, with 13,000 men back at work.

The Association of Steel Employees, Youngstown's independent union group, wired Governor Townsend on Monday to the effect that the men were getting out of hand and wanted to return to work. They urged that the National Labor Relations Board be allowed to settle the dispute, as is its purpose, and let them be working meanwhile. Troops were asked so that they might return to the mill Tuesday morning. Townsend in reply asked that the back-to-work movement be withheld for 48 hr., to which the independents agreed.

A ministerial post card poll of about 7000 Youngstown workers revealed last week that 86.8 per

cent desired to return to work, provided it could be done in safety, while only 13.2 expressed themselves as being willing to continue the strike until a CIO contract is signed.

The company has reiterated time and again its original statement that the mill will not be opened until it is definitely safe for workers to pass to and from their work. A spokesman for the independent union said today that, should the mill be opened without assurance of adequate protection, the men, who have gone payless for five weeks, would attempt to gain entrance to the mill so that operations could be resumed.

The fact that Inland's stacks are smoking once more is said to be intensifying the situation among Youngstown's employees, who see no reason why they too should not be allowed to return to work. It is believed that that company may have objected to section 3 of the Inland letter (see below), which refers all future disputes to the Indiana Commissioner of Labor for a final decision. Unlike Inland, Youngstown's main plants are located elsewhere so that this arrangement could obviously not be adhered to rigidly. The company steadfastly expresses its determination not to sign a contract with CIO.

At Inland, where operations are

at capacity, the employees were mailed the following letter which makes clear the facts prior and leading up to the resumption of work July 1:

TO THE EMPLOYEES OF INLAND STEEL CO.:

Now that you are back at work we want you to know exactly what happened.

The facts are simple and clear, and are as follows:

First: We have stood squarely behind the Statement of Labor Policy we gave you on May 25, 1937.

Second: We have made no agreement with the SWOC.

We have complied with the request of every public authority for full information about the strike.

We met continuously for nearly a week with the members of the Steel Mediation Board appointed by the President, and explained our position. That board has since adjourned.

The entire question of the strike has been placed before the National Labor Relations Board. These hearings are now being conducted. Eventually either by the decision of that board or by the courts to whom appeal may be made, we shall all know what the law requires.

On Friday, June 25, Governor Townsend of Indiana asked us to talk to him. We did so, and explained our position to him in full. We gave him a copy of the statement of labor policy which we had sent to you, with a letter explaining our position in the strike.

On Tuesday evening by telephone the Governor asked us to give him certain assurances regarding our labor policy, which we did. The exact language was as follows:

1—The men will be returned to work without discrimination between strikers and non-strikers.

2—Positive assurance that the labor policy as set forth by the Inland Steel Co. in their letter to the Governor of June 26, 1937, and statement as to labor policy attached thereto, dated May 25, 1937, will be carried out.

3—All grievances which may hereafter arise on labor matters within the scope of the statement dated May 25, 1937, will be settled in the manner outlined in that statement. If any such settlement, so arrived at, is unsatisfactory, the company will refer the matter to the Commissioner of Labor of the State of Indiana, and will accept his decision as final.

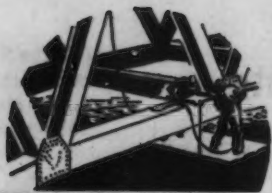
We then announced that our plants would reopen and that we expected the public authorities of Indiana to maintain order.

Thereafter we made no change in our position.

At 11 o'clock on the evening of Wednesday, June 30, Governor Townsend, by telephone, made to us the simple announcement that the pickets would be withdrawn.

This is the full story of how the strike was terminated, and we are very happy that the plant has resumed normal operation without violence.

WILFRED SYKES,
Assistant to President
Inland Steel Co.



FABRICATED STEEL

NORTH ATLANTIC STATES

Auburn-East Machias, Me., 108 tons, two State bridges, to Berlin Construction Co., Inc.

New York, 2650 tons, Christopher Co-

lumbus High School in Bronx, to Bethlehem Steel Co.

New York, 500 tons, alterations to Manhattan Bridge, to American Bridge Co.

New York, 1050 tons, bulb angles for

Treasury Department, to Egleston Brothers & Co., Long Island City.

New York, 150 tons, addition to Arnold Constable store, to DeVoe Iron Works.

New York, 130 tons, theater alterations, 1603 Broadway, to Bethlehem Fabricators, Inc., Bethlehem, Pa.

Brooklyn, 2650 tons, Lafayette High School, to Bethlehem Steel Co.

Brooklyn, 925 tons, school No. 191, to Harris Structural Steel Co.

Jamaica, N. Y., 170 tons, Dominican Commercial High School, to Reiche & Penner.

Arrochar, Staten Island, N. Y., 130 tons, St. John Baptist Novitiate, to Schacht Steel Construction Co.

Troy, N. Y., 320 tons, gymnasium addition, Rensselaer Polytechnic Institute, to Jones & Laughlin Steel Corp.

Paterson, N. J., 260 tons, grade crossing elimination, to American Bridge Co.

THE SOUTH

Grottoes, Va., 895 tons, Duplan silk mills, to Virginia Bridge Co., Roanoke, Va.

Power, W. Va., 110 tons, foundation cylinders, to Pittsburgh-Des Moines Steel Co.

Alcoa, Tenn., 195 tons, Aluminum Co. of America building extension, to Fort Pitt Bridge Works Co., Pittsburgh.

Houston, Tex., 835 tons, Federal office building, to Mosher Steel Co., Dallas, Tex.

CENTRAL STATES

Detroit, 270 tons, Brewster housing project, to Joseph T. Ryerson & Son, Inc.

Cleveland, 105 tons, Shaker Heights theater, to Ingalls Iron Works Co., Birmingham.

Indianapolis, 3300 tons, International Harvester Co., to Gage Structural Steel Co., Chicago.

Elkhart, Ind., 250 tons, American Coating Mills building, to Elkhart Bridge & Iron Co.

Chicago, 175 tons, Wrigley Field bleachers, to Midland Structural Steel Co., Cicero, Ill.

Moline, Ill., 835 tons, bridge, to Clinton Bridge Works, Clinton, Iowa.

Buchanan County, Mo., 125 tons, bridge, to St. Joseph Structural Steel Co., St. Joseph, Mo.

Columbus, Neb., 380 tons, anchor towers, to Aeromotor Co.

Columbus, Neb., 350 tons, transmission towers, Loup River Public Power and Irrigation District, to Lehigh Structural Steel Co.

WESTERN STATES

San Francisco, 2800 tons, railway terminal for San Francisco-Oakland Bay bridge, to Columbia Steel Co., San Francisco.

Sacramento, Cal., 100 tons, air depot, to Golden Gate Iron Works, San Francisco.

NEW STRUCTURAL STEEL PROJECTS

NORTH ATLANTIC STATES

Casco-Naples, Me., 100 tons, State bridge. Southbridge, Mass., 100 tons, optical company plant addition.

Springfield, Mass., 100 tons, life insurance company building.

Brockton, Mass., 100 tons, street railway garage.

Brattleboro, Vt., 100 tons, theater.

Norwich, Conn., 350 tons, Shetucket River bridge; bids in.

New York, 3765 tons, Queens-East River Tunnel; Walsh Construction Co., Long Island City, general contractor.

New York, 650 tons, curbing for United State Treasury Department.

TRIPLE COMPRESSION SCRAP BALERS



STYLE
100 TC
(100 x 51 x 36)
and other sizes

Also Regular
**Double
Ram Presses**
in all sizes



GALLAND-HENNING

MANUFACTURING COMPANY

2724 S. 31st Street Milwaukee, Wisconsin

COMPLETE LINE OF BALERS: Electric and Hydraulic, also HYDRAULIC PRESSES AND PUMPS

This Pulley Revolutionized FLAT BELT Performance...

TEN BIG POINTS

- 1 Belt slippage eliminated.
- 2 Belt sealed to pulley by Vacuum Cups.
- 3 Belt "slap" eliminated.
- 4 Tight stretching of belts unnecessary.
- 5 Life of belt greatly increased.
- 6 Use of belt dressing unnecessary.
- 7 Production noticeably stepped up.
- 8 No power loss on heavy shock loads.
- 9 No pulley maintenance expense.
- 10 Vacuum Cup Pulleys never wear out.



Patented in United States, Great Britain and Canada.

Pick out your toughest job
and order a pulley on our 30-
Day Free Trial Offer

VACUUM CUP METAL PULLEY CO., INC.

1010 FORD BLDG.

DETROIT, MICH.

"A Belt Never Squealed on a Vacuum Cup Pulley"

New York, 2200 tons, contract WB-4, Bronx-Whitestone bridge, Triborough Bridge Authority; previously reported as 200 tons.

New York, 270 tons, addition to public school No. 86 in Bronx; bids close July 9.

Queens, N. Y., 2550 tons, William Cullen Bryant High School; bids close July 9.

Brooklyn, 280 tons, addition to public school No. 197; bids close July 9.

Jamaica, N. Y., 360 tons, school, Immaculate Conception Church.

New Rochelle, N. Y., 300 tons, store, 721 Fifth Avenue Corp.

Perth Amboy, N. J., 250 tons, lead mill building, American Smelting & Refining Co.

Bound Brook, N. J., 230 tons, building, Bakelite Corp.

Woodbridge, N. J., 236 tons, bridges; Weldon Construction Co., Westfield, N. J., low bidder.

State of New Jersey, 170 tons, grade elimination, Central Railroad of New Jersey; bids July 19.

Philadelphia, 4500 tons, court house; McCloskey & Co., Philadelphia, low bidders.

State College, Pa., 500 tons, women's dormitory; bids in.

Harrisburg, Pa., 200 tons, Pennsylvania Railroad engine facilities; bids in to McCloskey & Co., general contractors.

Johnstown, Pa., 400 tons, building, Pennsylvania Telephone Co.

Centre County, Pa., 105 tons, truss bridge; bids July 16.

Erie, Pa., 260 tons, East Avenue grade crossing elimination; Constructors & Engineers, Inc., Chicago, low bidder on general contract.

SOUTH AND SOUTHWEST

Ingleside, Tex., 490 tons, loading dock.

State of Oklahoma, 1152 tons, highway bridges, including Buchanan County, 235 tons; Kingfisher County, 187 tons; Garfield County, 300 tons, and Okmulgee County, 120 tons.

CENTRAL STATES

Dearborn, Mich., 300 tons, miscellaneous material for open-hearth furnace, Ford Motor Co.

Cleveland, 300 tons, airplane hangar, Gulf Oil Corp.

Cleveland, 100 tons, train shed for Fisher Body Corp.

Niles, Ohio, 240 tons, building for Niles Glass Co., General Electric subsidiary; Sam W. Emerson Co., Cleveland, general contractor.

Champaign, Ill., 100 tons, theater.

Ottawa, Ill., 250 tons, furnace building, Libbey-Owens-Ford Glass Co.

Chicago, 200 tons, Polish Alliance building; bids July 20.

South Chicago, 444 tons, Schwill grain elevator; bids taken.

South Chicago, 2000 tons, extension to Wisconsin Steel Co. plant; bids July 14.

State of Wisconsin, 210 tons, Neshkoro grade separation; C. B. Taylor, Decorah, Iowa, general contractors.

Ogallala, Neb., 400 tons, dam.

WESTERN STATES

Denver, 138 tons, railroad underpass and approaches; bids July 10.

Portland, Ore., 103 tons, North Santiam River bridge; bids July 16.

FABRICATED PLATES

AWARDS

Newberry, Mich., 100,000-gal. elevated water tower, to Chicago Bridge & Iron Works.

Calexico, Cal., 595 tons, pipe for Bureau of Reclamation, Specification 724, to Southwest Welding & Mfg. Co., Alhambra, Cal.

NEW PROJECTS

Philadelphia, 700 tons, five barges for Warner Co.; Welding Engineers, Inc., general contractor.

SHEET PILING

NEW PROJECTS

Mare Island, Cal., 5000 tons, coffer dam for Navy Department for use in building a dry dock; bids July 28.

General Motors Plans Another N. J. Plant

GENERAL Motors Corp., hard on the heels of the announcement of a Ternstedt Mfg. division plant for Trenton, N. J., has revealed plans for the construction within a few weeks of a new eastern service plant for the Inland Mfg. division to be located in Clark Township, south of Cranford, N. J. The Inland division makes steering

wheels, running boards, motor mountings and rubber and metal parts for automotive, refrigerator and radio uses. The new plant, located on the main line of the Lehigh Valley railroad, will stock the parts made in Dayton, Ohio, for shipment to eastern assembly lines and for export markets.

The projected Cranford plant will have about 100,000 sq. ft. of floor space. Completion is due within three months of the start of construction. This unit makes the fifth to be located in New Jersey.

**HIGH
STEARNS
DUTY
MAGNETIC EQUIPMENT**

**WHATEVER YOUR NEED
WHATEVER YOUR JOB**
Investigate

STEARNS MAGNETIC

Separators	Clutches
Drums	Brakes
Rolls	Special Magnets

Thirty-five years of practical pioneering magnetic engineering experience is back of the Stearns High Duty trade mark.

Constant development and research by Stearns engineers, together with extensive laboratory facilities, has been responsible for much of the present day wide-spread utilization of magnetic equipment.

Investigate Stearns products. Consult magnetic headquarters. Avail yourself of Stearns magnetic equipment whether for separation, protection, purification, reclamation, power transmission or special magnetic appliances. You can be sure of receiving high maximum operating efficiency at low costs, an improved product with a definitely profitable investment.

Write for our bulletin, "The House of Magnetic Magic."

STEARNS MAGNETIC MFG. CO.

Formerly Magnetic Mfg. Co.

635 S. 28th Street

Milwaukee, Wis.

Steel Ingot Output Down 19 Per Cent; Strikes Prevented a Half-Year Record

PRODUCTION of steel ingots during June dropped off sharply because of strike conditions and failed to equal the May output by nearly 1,000,000 gross tons, according to the monthly report of the American Iron and Steel Institute.

June production amounted to 4,183,762 gross tons, almost 19 per cent below the total of 5,153,559 gross tons produced in May. Percentage of capacity operated in June was 74.46, compared with 88.82 per cent in May.

Total production in the first six months of 1937 almost certainly would have set a new all-time peak for the half-year period had output not been curtailed by strikes. A total of 28,764,633 gross tons of steel ingots was produced during the first half of 1937, less than 1 per cent below the output of 29,036,274 gross tons in the first half of 1929. The total in the first six months of this year was almost four times as much as the total of 7,697,210 gross tons produced in the first half of 1932.

The tonnage produced in June was only 5 per cent above the output of 3,975,569 gross tons in June 1936 but the six months' total for this year was 35 per cent above the total of 21,276,097 gross tons in the corresponding period of last year.

Exports Highest of Post-War Period

WASHINGTON, July 6.—What in all probability represents at least the highest United States post war monthly export total for semi-finished and finished iron and steel products was reached in May, according to a preliminary report of the Metals and Minerals Division, Bureau of Foreign and Domestic Commerce. Shipments aggregated 405,810 gross tons and were valued at \$19,186,363 in comparison with 255,788 tons valued at \$15,854,933 in the previous month, and only 97,511 tons valued at \$7,387,862 in May,

1936. The May totals increased 54.5 per cent in quantity and 21 per cent in value when compared with the April totals, and 316 per cent in quantity and 160 per cent in value when compared with those for May, 1936.

Featuring the May exports were the sharp increases registered in shipments of both pig iron and steel ingots, in themselves more than sufficient to account for the exceptionally high trade. The export totals for these two basic requirements alone establish the fact that in all foreign producing countries there is an urgent need for materials for transformation into steel mill products. All of the leading items of export closely approximated the April figures (excepting hot-rolled strip steel) and at the same time exceeded May, 1936, shipments by a wide margin.

Pig Iron Outstanding

By far the outstanding product in the May trade was pig iron whose total of 117,598 tons compared with 38,177 tons in April, and only 121 tons in May, 1936. Next came steel ingots, blooms, etc., shipped to an aggregate of 99,551 tons against 5495 tons and 982 tons respectively.

Against the April totals, the outstanding increase (93,999 tons) was that registered in steel ingot shipments, followed by those in pig iron (79,421 tons), heavy rails (4071 tons), welded black wrought iron pipe (2056 tons), and plain wire (1207 tons). In all cases May shipments of the items enumerated were comfortably ahead of those in the corresponding month of 1936.

In the first five months of 1937 shipments aggregated 1,138,492 tons valued at \$67,989,315 in comparison with 450,859 tons valued at \$33,834,799 in the corresponding period of 1936, or increases of 148 per cent in quantity and 101 per cent in value. It will be noted that the tonnage for May (405,810 tons) was only about 40,000 tons lower than the aggregate (450,859 tons) for the first five months of last year. From a standpoint of tonnage, the leading items in this period were pig iron (200,657 tons), ingots, blooms, etc. (117,833 tons), tin plate and taggers' tin (126,417 tons), black steel sheets (98,016 tons), unfabricated plate (97,823 tons), 'other' steel bars (41,935 tons), hot-rolled strip steel (37,974 tons), and heavy rails (32,182 tons).

Scrap exports continued at an exceptional level in May when the record total of 637,679 tons (valued at \$13,708,219) was shipped, both a volume and value never before attained in monthly scrap shipments from the United States.

PRODUCTION OF OPEN-HEARTH AND BESSEMER STEEL INGOTS
(Reported by Companies Which in 1936 Made 98.29 Per Cent of the Open-Hearth and 100 Per Cent of the Bessemer Ingot Production)

	Reported Production (Gross Tons)		Calculated Monthly Production All Companies		Number of Weeks	Per Cent of Capacity
	Open-Hearth	Bessemer	Monthly	Weekly		
1936						
January	2,794,766	196,389	3,039,804	686,186	4.43	52.39
February	2,707,320	202,445	2,956,891	714,225	4.14	54.53
March	3,094,939	185,040	3,333,853	752,563	4.43	57.46
1st Quarter..	8,597,025	583,874	9,330,548	717,734	13.00	54.80
April	3,565,761	304,775	3,932,605	914,593	4.29	69.99
May	3,671,375	302,092	4,037,375	911,371	4.43	69.58
June	3,578,383	334,897	3,975,569	926,706	4.29	70.75
2nd Quarter..	10,815,519	941,764	11,945,549	918,182	13.01	70.10
1st 6 Months.	19,412,544	1,525,638	21,276,097	817,997	26.01	62.45
July	3,526,380	326,606	3,914,370	885,604	4.42	67.61
August	3,768,135	350,560	4,184,287	944,534	4.43	72.11
September	3,782,498	303,048	4,151,388	969,950	4.28	74.05
3rd Quarter..	11,077,013	980,214	12,250,045	932,981	13.13	71.23
1st 9 Months.	30,489,557	2,505,852	33,526,142	856,570	39.14	65.40
October	4,144,395	317,710	4,534,246	1,023,532	4.43	78.15
November	3,925,146	329,553	4,323,025	1,007,698	4.29	76.94
December	4,048,552	305,342	4,424,367	1,000,988	4.42	76.42
4th Quarter..	12,118,093	952,605	13,281,638	1,010,779	13.14	77.17
Total Year..	42,607,650	3,458,457	46,807,780	895,329	52.28	68.36
1937						
January	4,357,338	291,794	4,724,939	1,066,578	4.43	81.43
February	4,012,358	331,669	4,413,832	1,103,458	4.00	84.25
March	4,730,579	403,787	5,216,666	1,177,577	4.43	89.91
1st Quarter..	13,100,275	1,027,250	14,355,437	1,116,286	12.86	85.23
April	4,601,620	390,198	5,071,875	1,182,255	4.29	90.27
May	4,685,749	386,290	5,153,559	1,163,332	4.43	88.82
June	3,832,514	284,572	4,183,762	975,236	4.29	74.46
2nd Quarter..	13,119,883	1,061,060	14,409,196	1,107,548	13.01	84.56
1st 6 Months.	26,220,158	2,088,310	28,764,633	1,111,891	25.87	84.89

1936 figures revised.

June Pig Iron Output Down; First Half Rises 46.4 Per Cent

PRODUCTION of coke pig iron in June, at 3,107,506 gross tons, compares with 3,537,231 tons in May. As was to be expected on account of the strikes, the daily rate last month dropped 9.2 per cent from that in May, or from 114,104 to 103,584 tons.

Output for the first half of this year rose to 19,706,593 tons from 13,528,226 tons in the corresponding period last year, or a gain of 46.4 per cent in the daily rate. The first six months is the highest for that period since the all-time high reached in 1929, when 21,640,960 tons was produced, and contrasts sharply with the recent all-time low in 1933, when production dropped to only 4,441,003 tons.

There was a net gain of 11 furnaces making iron on July 1, the 181 furnaces operating at a rate of 105,975 tons daily, against 170 on June 1, producing 103,960 tons daily. Fourteen furnaces were blown in during the month and three were blown out or banked. The United States Steel Corp. put in one furnace and took one off blast, independent producers put 11 in operation and took one off blast and merchant producers put two in and one out.

Among the furnaces blown in were the following: One Ensley, Tennessee Coal, Iron & Railroad Co.; one Susquehanna, National Steel Corp.; one Sparrows Point, Bethlehem Steel Corp.; three Haselton, one Pioneer, Republic Steel Corp.; three Campbell, one Hubbard, Grace and Jeannette, Youngstown Sheet & Tube Co., and one Sloss-Sheffield Steel & Iron Co. furnace.

Furnaces blown out or banked included: One Gary, Carnegie-Illinois Steel Corp.; one Monessen, Pittsburgh Steel Co., and the Rackdale furnace of the Tennessee Products Corp.

The number of available furnaces making pig iron has been reduced from 241 to 240 by the dismantling of the Vanderbilt furnace of the Woodward Iron Co.

Daily Average Production of Coke Pig Iron

	Gross Tons				
	1937	1936	1935	1934	1933
January	103,597	65,351	47,656	39,201	18,348
February	107,115	62,886	57,448	45,131	19,798
March	111,596	65,816	57,098	52,243	17,484
April	113,055	80,125	55,449	57,561	20,787
May	114,104	85,432	55,713	65,900	28,621
June	103,584	86,208	51,570	64,338	42,166
½ year	108,876	74,331	54,138	54,134	24,536
July	83,686	49,041	39,510	57,821	59,142
August	87,475	56,816	34,012	59,742	43,754
September	91,010	59,216	29,935	50,742	36,174
October	96,512	63,320	30,679	33,131	26,199
November	98,246	68,864	31,398	33,131	26,199
December	100,485	67,950	33,149	33,131	26,199
Year	83,658	67,556	43,592	26,199	

Production of Coke Pig Iron and Ferromanganese

	Gross Tons		Ferromanganese†	
	Pig Iron*		1937	1936
	1937	1936	1937	1936
January	3,211,500	2,025,885	23,060	24,766
February	2,999,218	1,823,706	24,228	24,988
March	3,459,473	2,040,311	27,757	22,725
April	3,391,665	2,403,683	26,765	19,667
May	3,537,231	2,648,401	34,632	18,363
June	3,107,506	2,586,240	34,415	17,549
½ year	19,706,593	13,528,226	170,857	128,058
July	2,594,268	2,711,721	20,205	20,658
August	2,730,293	2,991,887	15,919	19,805
September	2,947,365	3,115,937	24,368	25,715
October	3,061,579	3,061,579	25,478	25,478
Year	30,615,797	30,615,797	254,728	254,728

*These totals do not include charcoal pig iron.
†Included in pig iron figures.

Merchant Iron Made, Daily Rate

	Tons				
	1937	1936	1935	1934	1933
January	16,106	10,537	3,926	7,800	2,602
February	16,514	11,296	6,238	7,071	2,863
March	16,457	10,831	7,089	7,197	2,412
April	14,517	13,897	8,799	8,838	1,908
May	19,483	12,814	8,441	9,099	3,129
June	15,870	14,209	7,874	9,099	4,089
July	11,619	8,644	7,880	6,783	7,756
August	12,148	8,194	6,042	4,986	10,034
September	12,526	10,090	5,765	5,834	7,839
October	13,645	11,199	6,010	5,358	5,358
November	14,739	12,503	4,399	4,399	4,399
December	14,852	13,312	4,399	4,399	4,399

Production by Districts and Coke Furnaces in Blast

Furnaces	(Gross Tons) Production		July 1		June 1	
	June (30 Days)	May (31 Days)	Number in Blast	Operating Rate, Tons a Day	Number in Blast	Operating Rate, Tons a Day
New York:						
Buffalo	232,868	222,273	12	7,840	11	7,170
Other New York and Mass.	39,999	27,737	3	1,335	3	970
Pennsylvania:						
Lehigh Valley	83,811	88,950	6	2,795	6	2,870
Schuylkill Valley	37,409	45,215	3	1,245	3	1,460
Susquehanna and Lehigh Valleys	38,300	33,542	2	1,275	2	1,220
Ferromanganese	777,282	796,762	38	25,795	39	25,825
Pittsburgh District	25,367	16,259	3	845	3	525
Ferro. and Spiegel	69,682	72,788	4	2,325	4	2,350
Shenango Valley	66,701	112,273	7	2,225	7	3,760
Western Pennsylvania	10,884	13,648	2	365	2	440
Ferro. and Spiegel	132,632	139,705	6	4,655	5	4,505
Maryland	157,803	166,048	7	5,260	7	5,160
Ohio:						
Mahoning Valley	152,736	328,889	16	7,355	7	5,160
Central and Northern	223,273	317,828	12	7,440	12	7,625
Southern	45,724	50,843	3	1,525	3	1,570
Illinois and Indiana	616,003	714,324	26	19,860	27	20,675
Michigan and Minnesota	100,129	98,580	6	3,340	6	3,180
Colorado, Missouri and Utah	58,119	57,872	4	1,935	4	1,865
The South:						
Virginia	2,710	2,882	0	90	0	95
Ferromanganese	26,514	26,966	1	885	1	870
Kentucky	203,714	200,147	17	7,425	14	6,440
Alabama	4,786	1,843	1	160	1	165
Ferromanganese	1,060	1,857	0	60	1	60
Tennessee						
Total	3,107,506	3,537,231	181	105,975	170	103,960

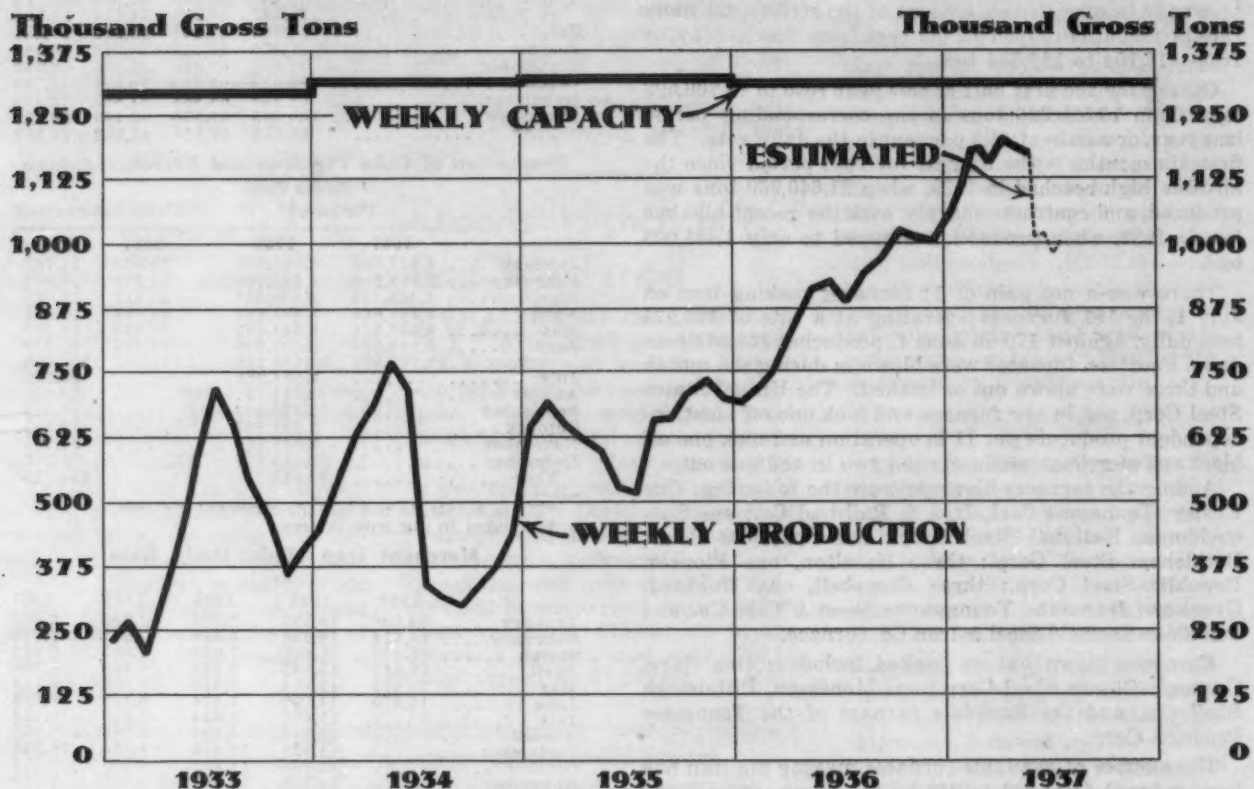
Follansbee's Bond Issue Reduced

JUDGE ROBERT M. GIBSON in United States District Court at Pittsburgh has signed an order approving modifications in the reorganization plan of the Follansbee Brothers Co., which were filed on May 17 and which were the subject of hearing June 1. These modifications reduced the amount of the proposed bond issue from \$4,500,000 to \$4,000,000 and estimated cost of proposed plant improvements from \$4,820,000 to \$4,000,000.

American Steel & Wire Co. resumed operations July 5 of its open hearth plant, blooming mill and three rod mills at its Donora, Pa., works, after a week's shut-down during which approximately 1100 employees enjoyed a week's vacation with pay. Repairs were made while the three departments were closed.

PRODUCTION

Average Weekly Production of Open-Hearth and Bessemer Steel Ingots by Months, 1933-1937, and Estimated Production by Weeks in 1937



Figures for the Current Week Are Not Indicated on the Chart Until the Following Week

STEEL INGOT PRODUCTION BY DISTRICTS: Per Cent of Capacity

	*Current Week	Last Week
Pittsburgh	69.0	78.0
Chicago	65.5	64.0
Valleys	73.0	63.0
Philadelphia	65.0	68.0
Cleveland	70.0	59.0
Buffalo	74.5	88.0
Wheeling	78.0	94.0
Southern	64.0	76.5
Ohio River	49.5	88.0
Western	79.0	95.0
St. Louis	76.0	93.0
Detroit	83.5	100.0
Eastern	81.5	98.0
Aggregate	70.0	76.5

* Allowance made for holiday.

Weekly Booking of Construction Steel

	July 7, 1937	June 29, 1937	Week Ended June 8, 1937	July 7, 1936	Year to Date 1937	1936
Fabricated structural steel awards.....	16,500	54,500	24,650	44,650	655,490	588,815
Fabricated plate awards	595	2,800	0	2,530	61,710	149,540
Steel sheet piling awards.....	0	0	0	0	35,555	22,620
Reinforcing bar awards.....	7,400	13,000	7,300	2,675	132,385	197,010
Total Lettings of Construction Steel...	24,495	70,300	31,950	49,855	885,140	957,985

...SUMMARY OF THE WEEK...

... *Strike-bound steel plants getting back to near-normal operation.*

o o o

... *New business declining, but backlogs assure high July operation.*

o o o

... *Steel scrap rises at Pittsburgh and Philadelphia; coke prices decline.*

WITH belated recognition by law enforcement authorities of the rights of non-strikers, the steel companies against which CIO activities have been directed have gradually been getting back to near-normal operation. Only the Indiana Harbor plant of the Youngstown Sheet & Tube Co. remains completely idle, a blast furnace at its South Chicago works having resumed operation. At Youngstown the company is operating at 90 per cent, a 40-point rise from last week. Republic Steel Corp. is operating its Youngstown district plants at an average of 60 per cent and its Corrigan, McKinney plant in Cleveland, which resumed work Tuesday, is now at 50 per cent, with a higher rate expected next week. The Cambria works of Bethlehem Steel Co. at Johnstown, Pa., are operating at the rate in effect prior to its strike. The Inland Steel Co., which reopened its plant July 1 on the basis of an arrangement with the Governor of Indiana, is back on full-time production.

Estimates of steel ingot production are complicated this week by the fact that open-hearth furnaces do not immediately make steel upon resumption, 48 to 72 hr. usually elapsing before the first heat is poured. Therefore the full effect of this week's renewed activity at Cleveland will not be felt until next week. The holiday on Monday also is reflected in this week's estimate of steel production. Had there been no holiday the rate would have been about 82 per cent, but allowance for the one-day idleness brings our estimate down to 70 per cent. By next week, if the Indiana Harbor plant of Youngstown Sheet & Tube Co. gets back into production, the rate may be 85 per cent or higher.

Although the strikes at steel plants have pretty generally resulted in a defeat for the CIO, the possibility of further trouble has not been removed, the latest outbreak having occurred in the Lake Superior iron mining district, where two of the Mesaba mines of the International Harvester Co. have been shut down by a strike for a signed contract. There are no positive indications, however, that the trouble will spread. Meanwhile water shipments of ore are now being made to plants that were shut down by strikes. Despite the holding up of some shipments because of the steel strikes, the total water movement in June was 10,107,883 tons, a gain of 64,027 tons over the

May figure. Up to July 1 the season's water movement of ore was 23,922,294 tons, an increase of 104.86 per cent over the amount brought down in the same period of 1936.

THE strikes caused a decline of 19 per cent, or about 1,000,000 tons, in steel ingot output last month, thereby preventing what would have been an all-time peak in production for the half-year period. The total for the first six months was 28,764,633 gross tons, compared with the peak record of 29,036,274 tons in the first half of 1929. There was a gain of 35 per cent over the output in the first half of 1936.

Pig iron production in June also lost ground because of the strikes, the total for last month being 3,107,506 gross tons against 3,537,231 tons in May, a decline in the daily rate from 114,104 tons to 103,584 tons, or 9.2 per cent. The six months' total, as in steel, was the highest since 1929, amounting to 19,706,593 tons, compared with 21,640,960 in the first half of 1929, and gaining 46.4 per cent over the first-half production last year. Despite strike shutdowns, there was a gain of 11 furnaces in June to 181 on July 1. The number of available furnaces has been reduced to 240.

THE second half of the year begins under favorable conditions except for strike difficulties. Although new business continues to decline, the rate of consumption is high in nearly all major lines except the automobile industry, where fresh buying during the next few weeks may reverse the present downward trend in orders. Steel backlogs are still substantial in a number of products, including tin plate, sheets, plates, structural shapes, oil-country pipe, and pig iron, assuring a high July operating rate. The reduction in duties on steel products by Great Britain may result in sufficient business to take up some of the seasonal slack in domestic business, provided American mills are attracted by the prices that may be offered. Many British consumers are suffering from a steel shortage.

There are signs of a revival of buying of railroad equipment as some car building shops approach the completion of their present orders. The Milwaukee is asking for bids on 1000 gondola cars and one locomotive, and the Soo Line will buy 100 box cars. The St. Louis-Southwestern has bought 4200 tons of rails, the first indication of a possible secondary rail buying movement. The Brazilian Railways have bought 17,000 tons of rails in this country.

Steel scrap prices have advanced 50c. a ton at Pittsburgh and Philadelphia and have strengthened elsewhere, chiefly because of the breaking up of the steel strikes. THE IRON AGE scrap composite price has advanced to \$17.42 from \$17.08, the first upward revision in 14 weeks. Contrariwise, Connellsville coke has declined 15c. a ton on the furnace grade and 25c. on the foundry grade.



...PITTSBURGH...

... Production drops sharply because of vacation shutdowns and holiday.

... Connellsville furnace coke off 15c., foundry coke 25c. lower.

... Heavy melting steel scrap higher as strike-bound plants resume.

PITTSBURGH, July 7.—Holiday and vacation shut-downs have caused a drop in the Pittsburgh ingot rate this week of nine points to 69 per cent of capacity. Except for the holiday shutdown, operations in the Johnstown area have returned to the level which existed previous to the time a strike was called. Wheeling district operations are off 16 to 78 per cent owing to reduced output because of the holiday.

Incoming business during June was about equal to bookings in May, although some companies report an increase. Fresh orders in the past week, however, have been off somewhat from the previous period, but part of the recession is undoubtedly due to the extended holiday week-end.

Tubular products continue to be the most active item on the list, there having been no letup in the volume of oil-country goods specifications. Hot and cold rolled bar bookings have leveled off slightly, but strip steel sales are holding to recent levels. Although most producers look for a further recession in buying, no sharp dip in total sales is expected.

A road improvement job at Pittsburgh will require approximately 1000 tons of reinforcing bars. Two sizable projects requiring 10,000 tons or more of steel sheet piling will be bid upon in the near future.

Most of the orders from automotive makers in the past week comprised fill-in requirements for 1937 models, and it is noticeable that prompt shipment on these specifications has been requested. A buying movement on a larger scale of material required for 1938 models is expected soon.

Raw material market conditions

are mixed, with beehive furnace coke off 15c. a ton; beehive foundry coke off 25c. a ton and No. 1 heavy melting steel up 50c. a ton. The weakness in coke may only be temporary until shipments held up by plants closed on account of labor disturbances are resumed.

Pig Iron

Pig iron consumption and production appear to be well balanced, although some producers are able to build up their stocks a trifle. There is some indication that foreign inquiry has become a little more active. One request for quotations involves about 2500 tons for a South American consumer. About half of the pig iron consumers have placed contracts for their third quarter requirements while the remainder are, for the time being at least, committed to odd lot buying as needed. Seasonal influences are affecting some jobbing foundries.

Semi-Finished Steel

Although the total volume of orders during June was greater than in May, the trend in the past few weeks has been downward. Mills, however, have substantial backlogs and supplies are by no means plentiful. Demand for skelp continues brisk and the movement of sheet and tin bars remains heavy.

Bolts, Nuts and Rivets

Fresh orders in the past few weeks have been slightly better in volume, but the improvement is not enough to offset disappointment of the producers in the rate of incoming business during the past several weeks. Some makers have had to curtail operations as new business is hardly 60 per cent of shipments. Some contracts for material to be used in 1938 automobiles have

been received, but the total amount involved so far is small.

Bars

Incoming business has been slowly dropping off in the past two weeks, but the downward trend is not sharp. Total bookings in June were below those placed in May. The bulk of present incoming business is comprised of miscellaneous tonnages, with fair support being given to the market by the unprecedented buying on the part of farm implement makers. Specifications from automotive interests do not involve large tonnages as yet, but a heavier buying movement is expected after the change-over period. Backlogs have been reduced further.

Cold Finished Bars

Aggregate specifications continue light with textile machinery manufacturers being the heaviest consumer in the past week. A number of fill-in orders from automobile concerns have been received recently and it is interesting to note that in all cases prompt shipment is requested. Some of these automotive orders are from companies which had thought their requirements were covered some time ago. Occasional business from jobbers covering miscellaneous sizes and grades is reported. Deliveries are much easier with some sizes obtainable in a week. However, certain sizes and grades are still not obtainable in less than four weeks. While June bookings made a better showing than those of May, the immediate tendency seems to be downward; at least until active buying on the part of automobile manufacturers for 1938 models takes place.

Reinforcing Bars

Quite a number of awards involving small tonnages have been placed recently. Two large jobs closed recently include 1500 tons of concrete reinforcing bars for a housing project at Detroit, and a total of 676 tons for a Bureau of Reclamation project at Phoenix, Ariz., awarded to Colorado Fuel & Iron Co. A road improvement at Pittsburgh will require approximately 1000 tons.

Steel Sheet Piling

Two sizable jobs are in the offing requiring 10,000 or more tons of piling. The Navy Department will take bids July 28 for 5000 tons or more for a coffer dam at Mare Island, Cal., where a dry dock is to be constructed. A bulkhead to be built at Rockaway, N. Y., will take approximately 4500 tons of piling.

Plates and Shapes

A large percentage of the inquiries in the past week involve school

A. Comparison of Prices

Market Prices at Date, and One Week, One Month, and One Year Previous;
Advances Over Past Week in Heavy Type, Declines in Italics

Rails and Semi-finished Steel

Per Gross Ton:	July 7, 1937	June 29, 1937	June 8, 1937	July 7, 1936
Rails, heavy, at mill.....	\$42.50	\$42.50	\$42.50	\$36.37 1/2
Light rails, Pittsburgh	43.00	43.00	43.00	35.00
Rerolling billets, Pittsburgh..	37.00	37.00	37.00	30.00
Sheet bars, Pittsburgh.....	37.00	37.00	37.00	30.00
Slabs, Pittsburgh	37.00	37.00	37.00	30.00
Forging billets, Pittsburgh..	43.00	43.00	43.00	37.00
Wire rods, Nos. 4 and 5, P'gh	47.00	47.00	47.00	38.00
	Cents	Cents	Cents	Cents
Skelp, grvd. steel, P'gh, lb...	2.10	2.10	2.10	1.80

Finished Steel

Per Lb.:	Cents	Cents	Cents	Cents
Bars, Pittsburgh	2.45	2.45	2.45	1.95
Bars, Chicago	2.50	2.50	2.50	2.00
Bars, Cleveland	2.50	2.50	2.50	2.00
Bars, New York.....	2.78	2.78	2.78	2.30
Plates, Pittsburgh	2.25	2.25	2.25	1.90
Plates, Chicago	2.30	2.30	2.30	1.95
Plates, New York.....	2.53	2.53	2.53	2.19
Structural shapes, Pittsburgh	2.25	2.25	2.25	1.90
Structural shapes, Chicago..	2.30	2.30	2.30	1.95
Structural shapes, New York	2.5025	2.5025	2.5025	2.16 1/4
Cold-finished bars, Pittsburgh	2.90	2.90	2.90	2.25
Hot-rolled strips, Pittsburgh.	2.40	2.40	2.40	1.95
Cold-rolled strips, Pittsburgh	3.20	3.20	3.20	2.60
Hot-rolled annealed sheets, No. 24, Pittsburgh.....	3.15	3.15	3.15	2.50
Hot-rolled annealed sheets, No. 24, Gary.....	3.25	3.25	3.25	2.60
Sheets, galv., No. 24, P'gh..	3.80	3.80	3.80	3.20
Sheets, galv., No. 24, Gary..	3.90	3.90	3.90	3.30
Hot-rolled sheets, No. 10, Pittsburgh	2.40	2.40	2.40	1.95
Hot-rolled sheets, No. 10, Gary	2.50	2.50	2.50	2.05
Cold-rolled sheets, No. 20, Pittsburgh	3.55	3.55	3.55	3.05
Cold-rolled sheets, No. 20, Gary	3.65	3.65	3.65	3.15
Wire nails, Pittsburgh.....	2.75	2.75	2.75	2.10
Wire nails, Chicago dist. mill	2.80	2.80	2.80	2.15
Plain wire, Pittsburgh.....	2.90	2.90	2.90	2.40
Plain wire, Chicago dist. mill	2.95	2.95	2.95	2.45
Barbed wire, galv., P'gh....	3.40	3.40	3.40	2.60
Barbed wire, galv., Chicago dist. mill	3.45	3.45	3.45	2.65
Tin plate, 100-lb. box, P'gh..	\$5.35	\$5.35	\$5.35	\$5.25

On export business there are frequent variations from the above prices. Also in domestic business, there is at times a range of prices on various products, as shown in our detailed price tables.

Pig Iron

Per Gross Ton:	July 7, 1937	June 29, 1937	June 8, 1937	July 7, 1936
No. 2 fdy., Philadelphia....	\$25.76	\$25.76	\$25.76	\$21.3132
No. 2, Valley furnace.....	24.00	24.00	24.00	19.50
No. 2, Southern Cin'ti.....	23.69	23.69	23.69	20.2007
No. 2, Birmingham†.....	20.38	20.38	20.38	15.50
No. 2, foundry, Chicago*....	24.00	24.00	24.00	19.50
Basic, del'd eastern Pa.....	25.26	25.26	25.26	20.8132
Basic, Valley furnace.....	23.50	23.50	23.50	19.00
Malleable, Chicago*	24.00	24.00	24.00	19.50
Malleable, Valley	24.00	24.00	24.00	19.50
L. S. charcoal, Chicago.....	30.04	30.04	30.04	25.2528
Ferromanganese, seab'd, car- lots	102.50	102.50	102.50	75.00

†This quotation is subject to a deduction of 38c. a ton for phosphorus content of 0.70 per cent or higher.
*The switching charge for delivery to foundries in the Chicago district is 60c. per ton.

Scrap

Per Gross Ton:	July 7, 1937	June 29, 1937	June 8, 1937	July 7, 1936
Heavy melting steel, P'gh....	\$18.75	\$18.25	\$18.75	\$13.75
Heavy melting steel, Phila...	17.75	17.25	17.75	12.25
Heavy melting steel, Ch'go...	15.75	15.75	15.75	13.25
Carwheels, Chicago	18.25	18.25	18.25	13.50
Carwheels, Philadelphia	19.75	19.75	19.75	13.75
No. 1 cast, Pittsburgh.....	18.75	17.75	19.25	14.75
No. 1 cast, Philadelphia....	20.25	20.25	20.25	14.25
No. 1 cast, Ch'go (net ton)..	15.25	15.25	15.25	12.00
No. 1 RR. wrot., Phila.....	19.75	19.75	19.75	14.75
No. 1 RR. wrot., Ch'go (net)	14.50	14.50	15.00	11.50

Coke, Connellsville

Per Net Ton at Oven:	July 7, 1937	June 29, 1937	June 8, 1937	July 7, 1936
Furnace coke, prompt.....	\$4.35	\$4.60	\$4.60	\$3.50
Foundry coke, prompt.....	5.00	5.25	5.25	4.00

Metals

Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Electrolytic copper, Conn....	14.00	14.00	14.00	9.50
Lake copper, New York.....	14.12 1/2	14.12 1/2	14.12 1/2	9.62 1/2
Tin (Straits), New York....	59.875	56.37 1/2	56.00	42.37 1/2
Zinc, East St. Louis.....	6.75	6.75	6.75	4.75
Zinc, New York.....	7.10	7.10	7.10	5.12 1/2
Lead, St. Louis.....	5.85	5.85	5.85	4.45
Lead, New York.....	6.00	6.00	6.00	4.60
Antimony (Asiatic), N. Y...	14.12 1/2	14.50	14.75	13.00

The Iron Age Composite Prices

Finished Steel

July 7, 1937	2.605c. a Lb.	
One week ago	2.605c.	
One month ago	2.605c.	
One year ago	2.159c.	
Based on steel bars, beams, tank plates, wire, rails, black pipe, sheets and hot-rolled strip. These products represent 85 per cent of the United States output.		
	HIGH	LOW
1937.....	2.605c., Mar. 9:	2.330c., Mar. 2
1936.....	2.330c., Dec. 28:	2.084c., Mar. 10
1935.....	2.130c., Oct. 1:	2.124c., Jan. 8
1934.....	2.199c., April 24:	2.005c., Jan. 8
1933.....	2.015c., Oct. 3:	1.867c., April 13
1932.....	1.977c., Oct. 4:	1.826c., Feb. 2
1931.....	2.037c., Jan. 13:	1.945c., Dec. 29
1930.....	2.273c., Jan. 7:	2.018c., Dec. 9
1929.....	2.317c., April 2:	2.273c., Oct. 29
1928.....	2.286c., Dec. 11:	2.217c., July 17
1927.....	2.402c., Jan. 4:	2.212c., Nov. 1

Pig Iron

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Steel Scrap

	\$17.42 a Gross Ton	
	17.08	
	17.42	
	13.08	
Based on No. 1 heavy melting steel quotations at Pittsburgh, Philadelphia and Chicago.		
HIGH		LOW
\$21.92, Mar. 30:	\$17.08, June 15	
17.75, Dec. 21:	12.67, June 9	
13.42, Dec. 10:	10.33, April 23	
13.00, Mar. 13:	9.50, Sept. 25	
12.25, Aug. 8:	6.75, Jan. 3	
8.50, Jan. 12:	6.43, July 5	
11.33, Jan. 6:	8.50, Dec. 29	
15.00, Feb. 18:	11.25, Dec. 9	
17.53, Jan. 29:	14.08, Dec. 3	
16.50, Dec. 31:	13.08, July 2	
15.25, Jan. 11:	13.08, Nov. 23	

buildings and factory additions. A telephone building at Johnstown, Pa., will require 400 tons of fabricated material. Awards have been fair in the past week and so far there is no indication of a sharp falling off in this type of business, although there are reports to the effect that some projects have been postponed or canceled. Structural plate and shape specifications have fallen off somewhat in the past week. There is no foundation for reports to the effect that a plate producer had inaugurated a quantity deduction for orders involving 150 tons or more.

Railroad Business

New buying on the part of railroads continues light and some car shops are about cleaned up on old orders. The New York City Board of Transportation is contemplating purchasing 100 subway cars. Pullman Standard Car Mfg. Co. is building two tavern and two coffee cars for Southern Pacific. The Brazilian Railways has placed an order for 17,000 tons of standard rails and about 800 tons of track accessories with a local rail mill.

Sheets

Sheet specifications in the past week show little change from the previous period. The total volume of incoming business is somewhat below the levels reached a few weeks ago, but this is attributable for the most part to the sporadic buying on the part of automobile companies. Miscellaneous sales are holding up well and most orders being placed are for fall requirements in view of the extended delivery promises. Cold rolled sheet specifications are lighter but jobber buying of galvanized sheets is heavy.

Tubular Products

Demand for oil-country goods is holding up well and orders are flowing in freely. Present buying, however still discloses anticipatory tonnages. Standard pipe business is the duller part of the tubular goods market. Apparently heavy stocks were built up a few months ago and have not yet been reduced to the point where a noticeable increase in specifications to the mills has materialized. The resumption of buying in this item may occur at a time when demand for other tubular products begins to slow up. Meanwhile, producers have still had no opportunity to build up their own stocks. Orders for small runs of line pipe are numerous.

Wire Products

Demand shows little change from a week ago. Orders for bright wire from wood screw and bolt and nut manufacturers and miscellaneous

sources are in fair volume, with deliveries on some sizes and grades quite extended. Spring wire backlogs are easier, but inquiries from automobile companies for 1938 models and the closing of furniture shows indicate a more active demand for this grade of wire in the near future. Although demand for merchant wire items continues light, there are signs of a resumption in buying as quite a few jobbers' stocks have reached a low point.

Strip

Total strip specifications have improved some in the past week. Practically all of the increase is attributable to fill-in orders from automobile makers. Almost all of these specifications are for prompt shipment. So far tonnages involving 1938 model requirements have not been large. Miscellaneous buying continues at recent levels and backlogs on hot rolled strip are about two to three weeks while cold rolled may be had in five to six weeks.

Tin Plate

Hampered by holiday shutdowns and to some extent hot weather, tin plate production is off somewhat this week and may be tentatively

estimated at 75 per cent of capacity. Some plants recently shut down during strike troubles have resumed operations, with the result that the industry's operating figure will probably show quite an increase next week. Producers will have a hectic time getting out all orders on the books between now and Oct. 1. Pressure for shipment has become a normal condition. Meanwhile, tin plate consumption is running ahead of the same period last year and prospects for a much better crop are growing brighter.

Coal and Coke

Beehive furnace coke, Connellsville, prompt, is off 15c. a ton, making it quotable at \$4.35 to \$4.60 a ton. This weakness may only be temporary, as it has been brought about by accumulations and hold-ups resulting from steel plants shutting down because of labor troubles. A resumption of buying on the part of these companies might cause a rebound to previous levels. The amount of coke purchased at \$4.35 a ton is not large. Foundry coke, Connellsville, prompt, is off 25c. a ton, making the lower range \$5 a ton. Meanwhile, accumulations at coke plants in the Connellsville regions are being rapidly worked off.



... Sheet demand improves, reversing recent downward trend.

o o o

... Pig iron business slow as melt declines.

CINCINNATI, July 6.—Ordering of sheets for new automobile models stimulated demand the past week to about 70 per cent of mill capacity and reversed the downward trend noticeable during the preceding two weeks. Ordering directly attributable to strikes in other steel districts diminished and, although not appreciable heretofore, is of small importance in current business. Automobile requirements are slightly better, while stove and household appliance demand is rapidly moving upward. Production the past week was at full mill capacity, but this week op-

erations will be down to about 75 per cent to allow for vacation periods. The hot mills and open hearths of the Middletown and Zanesville units of American Rolling Mill Co. will be closed, but annealing and finishing departments will be operating. The Ashland unit, however, will be in full operation. Other mills in the district, while observing the holiday, will be in full operation during the remainder of the week.

Indirectly, the labor disturbances in other areas are hindering third quarter pig iron ordering. Foundries are experiencing an easing of demand because of users' curtailed operations. Interest in pig iron has therefore declined and, with prices steady, no incentive to anticipate needs is offered. Virtually all second quarter contracts were completed by the first of the month. Furnace interests reported only a few cancellations and these involved small tonnages. The melt is easing. Operations are averaging about three days a week, and this week some plants will be closed for inventory and vacations.

Ingot production this week will be down to about 70 per cent, with one unit completely closed for repairs and vacation. Twenty-three open hearths out of 34 are scheduled for operation.



CHICAGO

... Ingot output rises with resumption of work by Inland Steel Co.

... New steel business and contract specifications lightest in a month.

... Farm equipment trade, especially tractors, one of brightest spots.

CHICAGO, July 7.—Ingot operations here rose $1\frac{1}{2}$ points this week to 65½ per cent of capacity, in spite of a 24-hr. shutdown at Gary because of the July 4 holiday, as a result of resumption of full-time operations at the plant of the Inland Steel Co., which opened Thursday morning, July 1, for the first time since May 26, when a strike was called by the CIO. Operations at other steel producing plants in this district, all of which are working save Youngstown, which is still closed by a strike, are at near capacity.

When operations are resumed at the Youngstown plant the entire district will be operating at a high rate. Inland reports a slight increase in backlogs over the strike period due in part to sympathetic offerings from customers.

Sales and specifications are the lightest of the last 30 days. Shipments appear to be nearly as heavy as in May, which was the best month of the year in that respect, and little decline is anticipated in shipments over the remainder of the summer. Plate specifications are good from makers of tanks, car builders and fabricators. No let-down has been noticed among agricultural implement makers, although a slight decline in activity is expected later. Tractor manufacturers have such heavy backlogs that their operations are sure to be maintained at present levels throughout July and August. The farm equipment trade is the heaviest single consumer of bars and strip at present. Automobile production has increased somewhat compared with the last few weeks. Little buying for 1938 models has been reported and even accessory makers are not active yet, as work

on present models has not yet been cleaned up.

The recent purchase of 4200 tons of rails by the St. Louis-Southwestern is believed by some to be the beginning of a secondary rail buying movement.

Although scrap shipments are again being made to Inland, there have been no new mill sales reported, and prices remain unchanged, in spite of a stronger feeling among the trade.

Pig Iron

Shipments in June were from 7 to 15 per cent less than in May. Some foundries, particularly those which supply the automobile industry, are closing down entirely for a week during which time all employees will receive vacations. Others which cater mostly to machine tool builders will probably also close down when the tool plants which they supply close for a week. One of the two furnaces at Youngstown's South Chicago works is in blast following the strike there and shipments are being made. Consumption this month is not expected by sellers to drop substantially, and an estimate made by one sales office for July predicts a reduction in shipments of only 1000 tons from June. A fourth quarter price increase is not considered likely here unless further advances in the costs of labor and raw materials occur. Operations at the Valley Mold & Iron Co. plant in South Chicago, where a strike has been in progress for some time, may get under way this week.

Cast Iron Pipe

The unseasonal dullness of this market is difficult to explain, but some sellers believe that the cutting

off of the formerly steady flow of Government funds to municipalities is to blame as the numerous PWA and WPA projects throughout the Middle West caused a good demand for pipe. Bids were taken July 1 on two Wisconsin jobs totaling 240 tons. Buying by the city of Chicago has ended for the time being, although some further purchasing is expected late in the year.

Plates

Orders are being received from tank makers, fabricators and car builders in good volume, but there is relatively little activity in pipe line construction. Railroads are merely specifying against old contracts whereas fresh business is being taken in some of the other lines. The Milwaukee Railroad has been authorized to buy 1000 gondola cars and one steam locomotive, but there is some possibility that the cars will be built in the road's own shops. Deliveries are no better and still require about 12 weeks.

Bars

Bar deliveries are running from about 30 to 60 days, with at least one mill said to be in need of tonnage. Specifications currently are greatest from the farm implement and tractor makers, with automobile interest less now than 1937 models are being cleaned up. A slight letdown is expected in implement manufacturing later in the summer, but tractor activity is expected to continue high through July and August.

Wire and Wire Products

Shipments of manufacturers' wire are running slightly ahead of orders at present, and tonnage is up somewhat from a month ago. Buying is general in character and is for immediate requirements. Very little material is going into stock. Old orders from the automobile industry are about cleaned up, and little new buying has been reported for 1938 model production as yet. Activity as reported in the wire fabric reinforcing line is better than normal, this being the best time of the year for that particular product.

Structural Shapes

Construction involving more than 100 tons of shapes is still light, and few inquiries are being received. Gage Structural Steel Co. was awarded 3300 tons of shapes for a manufacturing building at Indianapolis for the International Harvester Co. The additional steel to be required in this project is being held up pending the completion of plans for some of the other structures to be built there. The outstanding inquiry to be reported

this week is for extensions to the Wisconsin Steel Co. plant in South Chicago, where an addition to the open-hearth building will require about 1600 tons and another extension 400 tons. Bids will be taken July 14.

Rails

The St. Louis-Southwestern came into the market last week for 4200 tons of rail, thus establishing itself as the first purchaser here of a sizable tonnage at the \$42.50 price. Carnegie-Illinois Steel Corp. realized 3000 tons from the transaction while Inland Steel Co. and Tennessee Coal, Iron & Railroad

Co. benefited to the extent of 700 and 500 tons respectively. More buying is understood to be under contemplation by the various roads in this district, but no definite information is forthcoming at present. As the earnings of the roads improve, a secondary buying wave may be seen. With Federal courts having control over most purchasing at present, it is necessary to prove a sound financial condition before large expenditures are permitted.

Reinforcing Bars

Inland Steel Co. had barely opened its plant last week when

it secured the award of about 1600 tons of bars for the Brewster housing project in Detroit and 320 tons additional for the Parkside housing project in the same city. Bids on the post office garage which will take about 2000 tons have been postponed another week, while bids will be taken July 9 on 444 tons of bars for a grain elevator in South Chicago. About 200 tons will be up for bids July 20 for a Polish Alliance building in Chicago. With the exception of Inland's bookings, awards of over 100 tons were few and far between, and inquiries generally are likewise scarce. Prices are firm around Chicago.

Move to Broaden Scrap Export Bill; May Shipments Abroad 637,679 Tons

WASHINGTON, July 6.—Congressman Kopplemann, Democrat of Connecticut, co-sponsor of the pending Schwellenbach-Kopplemann bill to license the exportation of steel scrap, is expected to act this week to broaden the bill to include iron ore, pig iron and possibly other metals.

Kopplemann said he is seeking the support of a certain Senator, whose identity he would not reveal, in this latest move and that they expect shortly to discuss the matter with the President.

Although declining to forecast the future of such a revised measure, he said "a great deal of interest" has been shown in both the pending bill and in his announced intentions of broadening its scope.

Secretary of the Navy Swanson already has indicated the approval of his department to a broader measure. Secretary of War Woodring, in a report to the House and Senate Committees on Military Affairs, has supported a revised bill although the Inter-departmental Committee, headed by Secretary of State Hull,

submitted an adverse report on the original bill and opposed passage of such legislation.

No further action has been taken on the pending Schwellenbach-Kopplemann bill in the committees of either house. A sub-committee was designated on June 11 by the Senate Military Affairs Committee. Headed by Senator Thomas, of Utah, the sub-committee is collecting information on the scrap situation from various Government departments, and is expected to hold hearings on the subject.

Meanwhile an unprecedented volume of scrap exports during May was reported by the Bureau of Foreign and Domestic Commerce. A May total of 637,679 tons was reported, at a ton value of \$21, as compared with THE IRON AGE composite price of \$17.08 for steel scrap, as of June 29.

Simultaneously, pig iron exports in May jumped to a new high, totaling 117,598 tons at an average value per ton of \$25.60, as compared with THE IRON AGE composite price of \$23.25 as of June 29.

Scrap Exports Costing Steel Industry \$80,000,000 a Year, Republic

WASHINGTON, July 7.—Secretary of Commerce Roper has written to the House and Senate Military Affairs Committees opposing the Schwellenbach-Kopplemann scrap licensing bill. Roper concurs with the opinion of the inter-departmental committee that the "disadvantages of restrictive action would outweigh possible advantages."

Republic Steel Corp. also has

written to the committee, urging passage of the measure. The Republic statement characterizes present scrap exports as "appalling," and estimates they will reach over 3,000,000 tons in 1937. After two years of making munitions during the world war, the letter said, the scarcity of scrap was of "serious concern," in this country and if present rate of exports is continued the supply may be found insuffi-

cient to meet our needs for national defense. The letter estimated that scrap exports are costing the steel industry between \$80,000,000 and \$100,000,000 annually.

Roosevelt Avoids Labor Discussions

WASHINGTON, July 6.—While the belief grows that the tense labor situation, highlighted by the CIO campaign among independent steel companies, will sooner or later force White House action, President Roosevelt is studiously maintaining his hands-off policy. Beyond his statement of last week that the "nation as a whole" has a feeling of "a plague on both your houses," the President is tight-lipped on the labor situation. New Dealers insist that efforts, both in and out of Congress, are being made to get him tangled in the heated controversy. But if so, the effort has been unsuccessful. Futile attempts were made at the White House press conference today to get further expression from the President.

Would he comment on reports that he is about to break-off all friendly relations with John L. Lewis? he was asked. A report like that does not need comment, the press was told.

Had the President been asked by an unnamed Senator to intervene in the quarrel between the CIO and the AFL in an effort to patch up their differences? The President never even heard of the move, so it was stated.

Does the President approve of the volte-face of Madam Secretary of Labor Perkins, who, in a brand new style of thought, has attacked the sit-down strike as "unsuited to the temperament and conditions of our modern life." The President had not read her remarks, the press was informed.



... CLEVELAND ...

*... Strike-bound plants resume operations; Corri-
gan, McKinney at 50 per cent.*

o o o

*... Sheet & Tube at Youngstown up to 90 per cent;
Republic 60 per cent.*

o o o

*... Two Lake Superior iron mines shut down by
strike for signed contract.*

CLEVELAND, July 7.—With the resumption of operations by the Corrigan-McKinney plant of Republic Steel Corp., Cleveland, yesterday, that plant is now running seven open hearths or at 50 per cent of ingot capacity and expects to put on additional open hearths before the end of the week. This plant has also started up two of its blast furnaces.

With this increase in operations the Cleveland-Lorain district is now operating at 70 per cent of ingot capacity, a gain of 11 points from last week. In the Youngstown district, where there has been a gradual increase in operations since the resumption of work, the ingot output has increased to 73 per cent, a gain of 10 points over last week. Republic is operating at 60 per cent in the Youngstown district, a gain of 15 points, and Youngstown Sheet & Tube Co. is up to 90 per cent, or a 40 point gain.

Incoming orders for finished steel continue rather light, showing little change from recent weeks. Absence of substantial tonnages from the motor car industry is doing much to restrict the volume in sheets, strip steel and bars. Many consumers still have good stocks.

Deliveries of nearly all products are slowly improving, and mills that were shut down wholly or partly by the strikes are now taking care of the orders of their regular customers. Some producers are now well caught up on deliveries on bars, hot and cold rolled sheets and wire products. With the cutting down of mill backlogs, few consumers are now placing orders except for early requirements.

Lake Superior mines that were shut down because of strike have

resumed operations and water shipments of ore are now being made to steel plants that were shut down. However, activities of the SWOC in the Minnesota ore mining district resulted yesterday in the closing of two mines on the Mesaba Range.

Bars, Plates and Shapes

The new quantity and cutting extras on shapes have been generally adopted by mills and are expected to divert some small orders from mills to warehouses. As an order is not restricted to sections of one size, buyers of a small lot of one size probably will often include enough sections of other size to make three tons and avoid paying the extra. For less than one ton, the mill price, delivered Cleveland, is now 3.76c. or still \$2 a ton less than the warehouse price. However, the new mill cutting extra is likely to divert some business to warehouses which cut shapes to 5 ft. lengths without a cutting charge, while mills now charge an extra for cutting to less than 8 ft. lengths.

Pig Iron

The relighting of at least two Cleveland blast furnaces this week, heretofore shut down by strikes, will increase pig iron production, but output of these furnaces will not immediately become available for merchant use, as the iron is to be used hot for the time being in open-hearth steel making. Normally these furnaces figure partly in the production of merchant pig iron. Shipments of iron are tapering off slightly. Foundries have taken in the bulk of tonnage due them on old contracts, and business placed for third quarter delivery has not been extensive. July will be a less active month than June, and foundry operations are already

being interfered with to some degree by temporary suspensions at various plants owing to slackness in business.

Sheets

Ohio sheet mills that were shut down by strikes are now being crowded for shipments by their regular customers, few of whom placed business elsewhere when their usual sources of supply were temporarily cut off. Little tonnage is coming from the automotive industry and this is holding down the volume of new business. However, a fair amount of new tonnage is coming from makers of air conditioning equipment, filing cases and other building equipment, refrigerator manufacturers and from other miscellaneous buyers. Deliveries continue to grow better.

Strip Steel

Little new business is coming from automobile plants and some mills have about cleaned up outstanding orders from this source. Some makers report a slight improvement in the demand for hot rolled strip from hardware manufacturers.

Iron Ore

Labor troubles reached the Lake Superior ore district Monday when two Mesaba district mines operated by the International Harvester Co., were shut down and these are now being picketed. While John L. Lewis has made this entering wedge in an attempt to unionize the iron mines or close them down, mine operators still seem rather confident that the movement will not make much headway. The Oliver Iron Mining Co., U. S. Steel subsidiary, so far has not signed an agreement with the Lewis organization. John Bernard, a Farm Labor congressman from Minnesota, has been appointed field director of the SWOC in the iron mining districts. With the collapse of the steel strike, the Youngstown Sheet & Tube Co. and the Inland Steel Co. have resumed operation of mines and shipment of ore. The Republic Steel Corp. has started up some of its mines that were shut down during the strike.

Lake Superior ore shipments during June gained slightly in spite of rearrangement of shipping schedules due to the entire cutting off of shipments to the three independent steel companies that were affected by strikes. Shipments by water during June amounted to 10,107,883 tons, a gain of 64,027 tons over the previous month and an increase of 3,499,563 tons or 52.96 per cent over June last year. Water shipments until July 1 were 23,922,294 tons, an increase of 104.86 per cent over the same period last year.



.. PHILADELPHIA ..

... District operations down three points to 65 per cent.

... Buying continues to lag, but backlogs show little change.

PHILADELPHIA, July 7.—The Pencoyd plant is down the entire week for much needed repairs, but full operation with six furnaces is expected by next Monday. All other district producers are refining steel at an unchanged pace, and are barely able to keep up with the demands of their rolling departments. The change at Pencoyd, plus the holidays, has dropped district operations for the week from 68 per cent to 55 per cent, but next week's rate should show a return to the higher figure.

All through June most mills reported that new business was considerably under the volume of deliveries. However, since the month's figures have been tabulated, a number of the producers state that the drop in orders was not nearly as severe as had been previously estimated. This contention is verified by the fact that backlogs do not show any significant change, although the likelihood that a number of export orders have recently been added to books should not be ignored.

The easing of strike tension has been a major influence in injecting a little life into the scrap market. Brokers insist that their position is stronger, and are equally confident that sales over the next fortnight will establish somewhat higher price levels. Also significant is that bidding for items on the recent Pennsylvania Railroad list was more active and prices in most cases were up from a month ago.

Pig Iron

Deliveries are going forward on schedule, and most buyers have either enough stocks or sufficient iron on order to carry them through August and into September. For this reason there is little interest in new orders, and furnaces do not expect this sentiment to shift until fourth quarter books are opened or

the market gets worried as to possible price advances for the last quarter.

Sheets

Inquiry has fallen off considerably, but the best delivery currently possible on new business is eight weeks, with several of the larger makers booked up for 20 or more weeks. A confusing factor is the maintenance of backlogs over the past month despite the fact that shipments have consistently exceeded new orders. This situation leads to the belief that more export business has been taken during this period than has generally been admitted. At the present time there is inquiry out from such widely scattered points as Norway, New Zealand and South America. The Reading Railroad has distributed all sheet requirements for its car repair program, but buying on the part of other carriers is light and sporadic. Sellers look for general disinterest on the part of consumers until the early fall period, at which time automobile buying will be approaching a peak and underground storage tank fabricators will show maximum seasonal activity.

Shapes and Bars

Construction activity is currently showing a bulge here, although no fabricator has enough attractive business on the book to keep all estimators busy. The future is none too attractive inasmuch as New Jersey and Pennsylvania are keeping highway construction programs to a minimum. The Philadelphia court house, which will take 4500 tons of shapes and 900 tons of bars, is still hanging fire, although McCloskey & Co. have been announced as low bidder on the general contract. Virginia Bridge Co. secured the 880 tons of shapes for a Duplan Silk Co. building at Grottoes, Va., and bids go in this week on a 500-ton dormitory at State College, Pa.

Demand for reinforcing bars continues to be light with prices none too steady. The only new project of consequence is a Norfolk, Va., overpass requiring 515 tons of bars, on which bids are due late this week.

Plates

Welding Engineers, Inc., Philadelphia, will be in the market for 700 tons of plates, light shapes, etc., for the construction of five barges at the Van Schiver plant of the Warner company. This fabricator is currently completing construction of a welded tug boat hull on the same inland lake owned by the Warner company. Plate inquiry, like sheets, is now not very active. Delivery on universal plate is possible to a limited extent in three to four weeks, but seven or eight weeks or longer are necessary to secure heavy sheared material.

Warehouse Business

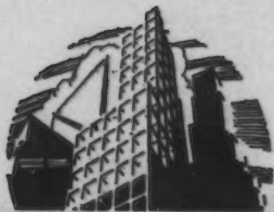
Current activity is somewhat spotty, and major concerns are looking for total July business to fall at least 10 per cent below the June level. Sheet demand is particularly slack at the moment, but calls for stainless and other alloy steels are holding up well. All warehouses have excellent stocks and are well represented on mill order books; consequently, at the moment they are showing little interest in new commitments. No house has voiced a doubt as to a probable rapid and sustained pickup in demand in the early fall.

Imports

The following iron and steel imports were received here during the past week: 8550 tons of chrome ore from French Oceania; 1500 tons of chrome ore from South Africa; 8250 tons of manganese ore from the Gold Coast; 21 tons of pig iron from British India; 406 tons of iron ore from Norway, and 25 tons of structural shapes from Belgium.

Machinery Exports Continue to Gain

EXPORTS of industrial machinery from the United States during May of this year amounted to \$21,795,768, as compared with \$13,599,054 exported during May, 1936, according to preliminary figures compiled by the Machinery Division, Department of Commerce. While the May figures show a 4 per cent decline from the previous month of this year, there is shown an increase of 60 per cent over the exports of May, 1936.



... NEW YORK ...

... *Dullness prevails in markets, with sales volume down considerably.*

... *Mills still have large backlogs in some products.*

... *Foreign inquiry continues a feature of pig iron market.*

NEW YORK, July 7. — The holiday week brought a sharp drop in orders for various steel products, the total volume probably being the smallest for any week of the year thus far. To what extent the holiday influence was responsible cannot be determined until it is seen what the developments are in the next week or two.

Some mills are now anxious to book tonnage in certain lines, but there are still substantial backlogs in other products. Deliveries have improved in bars, strip, some grades of sheets, but most mills have large orders on their books for plates and to a lesser extent in structural shapes. Tin plate specifications have dropped off, but only because the mills are already committed for all of the tonnage they can produce and ship by Oct. 1. Mills whose production of tin plate has been affected by strikes will not be able to complete their orders by Oct. 1. Standard pipe is one of the dull spots in the market, jobbers having ample stocks, which are not moving out very rapidly.

The Standard Transportation Co., subsidiary of Standard Oil Co. of New Jersey, has awarded contract for two tankers to Federal Shipbuilding. Each boat will take about 2500 tons of steel.

Sheets and Plates

Sheet business continues at the lower level established a few weeks ago. The June volume of orders booked was 15 to 20 per cent below that of May. No upturn in orders is looked for before early August. Plate business is spotty, some district offices reporting a substantial volume in plates and shapes, while the majority point to a marked dullness in recent weeks. Plate

shipments are still being held up to local shipyards, which are entering the fourth week of the strike with six locals of the Industrial Union of Marine and Shipbuilding Workers of America. The union has appealed to President Roosevelt to intervene in forcing a settlement. New railroad business is light, the only car buying in sight being 150 cars for 8th Avenue subway line, which will probably be split between Pullman and American Car & Foundry.

A spurt in British inquiry was noted immediately following the announcement of the reduction in import duties on steel products. Sheets and plates should share in this foreign demand, as well as semi-finished material.

Wire

There is little change in the demand for either round or flat wire. Some unsolicited business is reported by one seller, amounting to several carloads, and the outlook appears healthy. While some grades of common wire are obtainable in a week to 10 days, other grades, which a month or so ago could not be supplied in less than 12 weeks by a leading fabricator, are now obtainable in four to five weeks.

Pig Iron

Holidays and the normal seasonal recession kept buying activity at a low rate this week. This period of quietude is considered by some furnaces to be a blessing in disguise as it gives the furnaces an opportunity to build up depleted stocks. The possibility of a \$1 increase in iron prices is considered by many interests to be a logical move, in consideration of recent events, and the momentum this pos-

sibility is acquiring is expected to inspire some speculative buying in August which, added to the consumer interest expected to develop then, should result in a very active market at that time, barring unforeseen occurrences. Little forward buying is reported and most shipments involve carload lots, applying on contracts. Export inquiry continues at a high rate. Inquiries have increased in number in the previous week, but the tonnages per inquiry have decreased, being between 500 and 2000 tons. Great Britain and China were buyers. The French financial crisis has killed, for the time being at least, the feasibility of France buying pig iron here.



... ST. LOUIS ...

... *Steel and pig iron markets quiet.*

ST. LOUIS, July 6.—The usual holiday quiet prevails in the market for finished steel. Oklahoma Highway Commission opened bids on June 25 for highway projects requiring 1152 tons of structural shapes and 200 tons of reinforcing bars. This is the first activity of any consequence in highway improvements in the Southwest in several months, and the trade is hopeful that other states will be in the market soon.

The market for pig iron is quiet so far as sales are concerned, but the melt in the district continues at a high rate. Steel mills closed only for the holiday. The agricultural implement plants in the Tri-Cities, which have been going strong, will close down this week to give their men a short vacation. Jobbing foundries in the district are very busy.



... BUFFALO ...

... *Pig iron situation strong.*

BUFFALO, July 6.—Buffalo pig iron makers had a very good shipping month during June. The market is described as very strong, with a consistent demand from all classes of foundries. The beginning of the third quarter finds some melters dipping into inventories,

but buying has been heavy since the first of June, with all sorts of tonnage from small lots up to 2000 and 3000 tons being booked. Makers are convinced that a firm market will exist throughout the next three months.

Schedules show Bethlehem's Lackawanna plant operating five furnaces; Republic, two; Hanna Furnace Corp., three; Tonawanda Iron Corp., one, and Wickwire-Spencer Steel Co., one. The last-named furnace is on basic iron.

Open hearth furnaces in service this week are 28 out of 30 at Bethlehem's Lackawanna plant, seven out of nine at Republic and three out of four at Wickwire-Spencer.

The Buffalo steel industry is beginning to feel the effects of the reopening of Middle West plants. Concerns here accumulated considerable business that ordinarily would have gone to the idle plants. Customers are now returning to their old sources of supply. The automotive industry shows indication of a falling off, but no plans have been made to cut the operations schedule of open hearths here immediately.

Among the reinforcing steel jobs is one of 110 tons for a creek improvement plan in the town of Cheektowaga. It is understood this business went to Igoe Bros., Newark.



...BIRMINGHAM...

... Outlook for Southern mills and furnaces promising for some months.

BIRMINGHAM, July 6.—Birmingham steel mills and blast furnaces are starting the third quarter in fine shape. Backlogs, reinforced by a moderate flow of new business, provide a satisfactory outlook for some months. Seasonal recessions in some lines are more than offset by old tonnage, so that production and shipments continue unabated at high points. Strikes have slightly curtailed shipments of pig iron to some points in the Middle West and over the South, but not to a serious extent as yet.

Production is holding steady. Last week all of the district's 18 blast furnaces and 19 out of 24 open hearths were operating. The same number will operate again this week.

The two old Vanderbilt blast furnaces of the Woodward Iron Co. are

to be dismantled and sold for scrap. This leaves the Woodward Iron Co. with three furnaces at Woodward, all of which are now operating. One of the Vanderbilt furnaces had not been in production since 1919 and the other since 1926.



... Sales slump owing to holiday and summer lull.

TORONTO, July 6.—Dominion Day and the summer holiday season affected business in the iron and steel markets the past week. Sales dropped sharply, but steel interests look upon the slump as one of short duration. Consumers are expected to be in the market again within the next few days. The automotive industry has reduced purchases and is cleaning up on old car models, but will start buying within the next six weeks for 1938 models. There has been no general curtailment in steel plant operations, which are holding around 75 per cent capacity. Backlogs are sufficient to keep plants in continuous operation at present rates for several months, while spot demand is in good volume compared with other years since 1930. No changes have been announced in prices.

Merchant pig iron sales were affected by the holiday. Deliveries against contracts are going forward on schedule.

Scrap dealers state that inquiries for heavy melting steel and machinery cast are considerably in excess of supplies. New offerings of these grades are limited, but there has been some improvement from producing plants. Scrap prices are showing minor fluctuations.



...BOSTON...

... Some letdown in New England industrial activity.

BOSTON, July 6.—June went out rather quietly in the pig iron market, and there is nothing at the

moment that suggests much more activity within the immediate future. Sales the past week were but a few hundred tons, mostly for nearby delivery. Owing to vacations and some letdown in bookings for castings, the New England melt is down somewhat from a month ago. Most of the largest melters are operating on a four or five day schedule.

General business is not shaping up as well in New England as anticipated, but still holds above last year's level. Of the lines allied with the steel industry, electrical appliances and special machinery are the brightest spots. Fabricating steel jobs have eased to a point where the largest firms are competing for the smallest tonnages. Competition among reinforcing steel bar firms is keen, yet prices are holding well. Warehouses are doing a fairly good business, but the size of individual orders has gradually shrunk since the last revision in steel mill prices.

Pig iron exports the past week totaled 3584 tons, including 2240 tons to Japan, 1120 tons to Liverpool, and 224 tons to Belgium.



...SAN FRANCISCO...

... Truscon gets order for 3200 tons of bars; Columbia books 2800 tons of shapes.

SAN FRANCISCO, July 6.—Outstanding award of the week on the Pacific Coast was that of 3200 tons of reinforcing bars to Truscon Steel Co. for the construction of a railway terminal building for the San Francisco-Oakland Bay bridge. Columbia Steel Co. took 2800 tons of structural for the same project. Reclamation projects accounted for the only other tonnages of consequence in the reinforcing market and aggregated 1513 tons. Colorado Fuel & Iron Co. accounted for 882 tons of this in two awards.

Bids were opened on 1800 tons of reinforcing bars involved in the construction of Sunset reservoir in San Francisco. Award is expected soon. Bids were also opened on 915 tons of bars for the All-American Canal reclamation project at Yuma, Ariz. V. R. Dennis was low bidder on the general contract.



...NON-FERROUS...

... *Copper buying continues brisk; London prices advance.*

o o o

... *Lead bookings rise substantially; zinc quiet.*

o o o

... *World tin stocks drop 1242 tons; quotations move upward.*

NEW YORK, July 7.—Consumer demand for the red metal continues in satisfactory volume, but there are no indications of the demand developing to any greater extent until the

strikes are definitely settled and steel mills back to normal production. Consumers are reported well covered up to September, and prices remain steady at 14c., Connecticut Valley, for the electrolytic

grade. The gradual resumption of operations at the steel mills here, and the clarifying of the French crisis, gave firmness to London markets, causing quotations to rise to 14.40c. per lb., c.i.f., usual Continental base ports, as compared with 13.75c. a week ago.

Lead

Bookings were estimated by some sources to be 50 per cent above last week, the new activity being well distributed among various types of users. July positions are 75 per cent covered, and, although some prompt metal is available, sellers are not overly anxious to dispose of it. Consumption continues to exceed production, and quotations are firm at 6c. per lb., New York. British prices advanced sharply today to 5.57c. per lb. for prompt metal, and 5.53c. for futures.

Zinc

Spot positions continue scarce, although much sought after by buyers who are apparently not interested in future commitments. Sales of prime Western for the week amounted to 4188 tons, with shipments totaling 5537 tons. Undelivered metal now stands at 52,926 tons, indicating a reduction in stocks of 1349 tons. Prices remained unchanged at 7.10c. per lb., New York. London prices, following the lead of copper, zinc and tin, rose to 5.05c. per lb., on first call this morning.

Tin

World tin stocks were reduced 1242 tons to 18,156 tons at the end of June, as compared with a reduction of 1024 tons in May. Active buying interest was evident in this week's market, with professional buyers taking most of the offerings, although yesterday the tin plate makers made a welcome appearance, centering their trading on nearby positions. Prices rose steadily during the week with but one setback, on Friday, and are quoted today at 59.875c., New York, for Straits metal, an advance of 3.50c. over last week's price position. This represents the highest point reached since April 14. British Straits metal, on first call this morning, was quoted at £266 10d for spot and future, and £265 10d for Eastern tin.

The average prices of the major non-ferrous metals in June, as based on the daily quotations appearing in THE IRON AGE, were as follows:

Electrolytic copper, Conn. Valley 14.00c.
Lake Copper, Eastern delivery.... 14.125c.
Straits tin, spot, New York..... 55.882c.
Zinc, East St. Louis..... 6.75c.
Zinc, New York..... 7.10c.
Lead, St. Louis..... 5.85c.
Lead, New York..... 6.00c.

The Week's Prices. Cents Per Pound for Early Delivery

	June 30	July 1	July 2	July 3	July 6
Electrolytic copper, Conn.*.....	14.00	14.00	14.00	14.00	14.00
Lake copper, N. Y.....	14.125	14.125	14.125	14.125	14.125
Straits tin, spot, New York.....	56.625	57.75	57.50	59.25	59.875
Zinc, East St. Louis.....	6.75	6.75	6.75	6.75	6.75
Zinc, New York.....	7.10	7.10	7.10	7.10	7.10
Lead, St. Louis.....	5.85	5.85	5.85	5.85	5.85
Lead, New York.....	6.00	6.00	6.00	6.00	6.00

*Delivered Connecticut Valley; price ¼c. lower delivered in New York.
Aluminum, virgin 99 per cent plus 20.00c.-21.00c. a lb., delivered.
Aluminum No. 12 remelt No. 2 standard, in carloads, 19.00c. to 19.50c. a lb., delivered.
Nickel, electrolytic, 35c. to 36c. a lb. base refinery, in lots of 2 tons or more.
Antimony, Asiatic, 14.12½c. a lb., prompt, f.o.b., New York.
Quicksilver, \$96.00 to \$98.00 per flask of 76 lb.
Brass ingots, commercial 85-5-5-5, 14.00c. a lb., less carload, delivered; in Middle West ¼c. a lb. is added on orders for less than 40,000 lb.

From New York Warehouse	
Delivered Prices, Base per Lb.	
Tin, Straits pig.....	58.75c. to 59.75c.
Tin, bar.....	62.00c. to 63.00c.
Copper, Lake.....	15.00c. to 16.00c.
Copper, electrolytic.....	15.00c. to 16.00c.
Copper, castings.....	14.75c. to 15.75c.
*Copper sheets, hot-rolled.....	21.75c.
*High brass sheets.....	19.75c.
*Seamless brass tubes.....	22.50c.
*Seamless copper tubes.....	22.625c.
*Brass rods.....	16.25c.
Zinc, slabs.....	8.00c. to 9.00c.
Zinc, sheets (No. 9), casks, 1200 lb. and over.....	13.75c.
Lead, American pig.....	7.00c. to 8.00c.
Lead, bar.....	8.00c. to 9.00c.
Lead, sheets, cut.....	10.50c.
Antimony, Asiatic ..	15.50c.
Alum., virgin, 99 per cent plus.....	22.50c. to 24.00c.
Alum., No. 1 for remelting, 98 to 99 per cent.....	19.50c. to 21.00c.
Solder, ½ and ⅓.....	35.00c. to 36.00c.
Babbitt metal, commercial grade.....	25.00c. to 65.00c.

*These prices, which are also for delivery from Chicago and Cleveland warehouses, are quoted with 3½ per cent allowed off for extras, except copper tubes and brass rods, on which allowance is 40 per cent.

From Cleveland Warehouse	
Delivered Prices per Lb.	
Tin, Straits pig.....	63.00c.

Tin, bar.....	65.00c.
Copper, Lake.....	15.00c. to 15.25c.
Copper, electrolytic.....	15.00c. to 15.25c.
Copper, castings.....	14.75c. to 15.00c.
Zinc, slabs.....	8.25c. to 8.50c.
Lead, American pig.....	6.50c. to 6.75c.
Lead, bar.....	10.00c.
Antimony, Asiatic.....	16.50c.
Babbitt metal, medium grade.....	25.50c.
Babbitt metal, high grade.....	67.00c.
Solder, ½ and ⅓.....	39.50c.

Old Metals, Per Lb., New York

Buying prices are paid by dealers for miscellaneous lots from smaller accumulators and selling prices are those charged to consumers after the metal has been prepared for their uses. (All prices are nominal.)

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, hvy. crucible.....	10.75c.	11.50c.
Copper, hvy. and wire.....	10.125c.	10.625c.
Copper, light and bottoms.....	9.125c.	9.375c.
Brass, heavy.....	6.125c.	6.75c.
Brass, light.....	5.00c.	5.75c.
Hvy. machine composition.....	9.00c.	9.50c.
No. 1 yel. brass turnings.....	7.375c.	7.875c.
No. 1 red brass or compos. turnings.....	8.75c.	9.25c.
Lead, heavy.....	4.625c.	5.00c.
Cast aluminum.....	12.125c.	12.25c.
Sheet aluminum.....	13.25c.	14.75c.
Zinc.....	3.50c.	3.875c.



IRON AND STEEL SCRAP

... Pittsburgh quotations advanced 50c. on No. 1 steel; \$1 on railroad heavy melting.

... Composite advances to \$17.42, first move upward in 14 weeks.

JULY 7.—For the first time since March 30, THE IRON AGE composite scrap price has been advanced over the preceding week. Standing now at \$17.42, it still has a long way to go to recover the ground lost from the high of \$21.92. Largely because of a substantial sale into consumption at Pittsburgh of No. 1 heavy melting steel at \$19 a ton, the price there has been advanced 50c. Railroad heavy melting steel has advanced \$1 on the strength of the closing of two sizable railroad lists at prices between \$20.50 and \$21. Philadelphia prices of the two leading grades have been marked up 50c. in sympathy with the Pittsburgh move. Chicago prices are stationary in the absence of new mill sales, but dealers have raised their buying prices at Detroit 50c. throughout the list. The present bullish attitude of the market is based upon resumption of mill activity, though no widespread mill buying has occurred. Dealers generally feel they will have to raise their buying prices to attract material into their yards.

Pittsburgh

The market is showing signs of strength, attributable for the most part to a resumption of operations at plants which have been shut down on account of labor troubles. No. 1 heavy melting steel is quotable at \$18.50 to \$19 a ton, up 50c. from last week's quotations as a result of a fairly large sale into consumption during the past week at \$19 a ton. Recent sales of railroad heavy melting are reported to have brought the equivalent of \$21 a ton delivered, up \$1 from the last sale. The Pittsburgh market is approaching the "vacuum" stage reached several times in the past when prices offered here were not high enough to attract scrap from the East. Practically all No. 1 heavy melting steel sold in this district at the present time is local scrap. With brokers covering the recent \$19 sale at \$18.50 for odd lots and \$18.75 for tonnages, it is much more than a possibility that

the next sales into consumption will be higher.

Chicago

Although the full-time resumption of operations by Inland Steel Co. is causing a good deal of scrap to flow once more, there still have been no new sales. According to brokers, there probably will not be much business done until the Youngstown Sheet & Tube Co. plant in Indiana Harbor opens, as other consumers here appear to be well supplied. Both in their yards and with orders on brokers' books. Sentiment, however, is stronger and in a few instances brokers' buying prices have been increased 50c. a ton.

Philadelphia

Price sentiment here has turned upward, reflecting in part some wishful thinking on the part of brokers and a somewhat greater difficulty of securing supplies from dealers at current quotations. Whether this tinge of bullishness will last, only developments over the next week or so will determine. So far, no mill has purchased any significant lot of material; nonetheless sellers' attitude has stiffened to such an extent that prices on several important grades are quotable 50c. higher. The Budd Company has sold its July accumulation of bundles, totaling about 4000 tons, at a price estimated near \$18 f.o.b., probably to a broker. A boat is currently loading 3500 tons at Port Richmond and another boat is expected next week to take on 6500 tons. At Baltimore, three ships are currently loading for the United Kingdom. Japan still shows no interest in acquiring new commitments, but the United Kingdom has several attractive inquiries out.

Cleveland

The reopening of strike-closed steel plants here this week has increased open-hearth operations, and contributed to a firmer undertone in the scrap market. Prices are steady but unchanged, since mills which have reopened are not yet ready to grant shipping releases on scrap held up by the strike. In the Youngstown district, the Brier Hill works of Youngstown

Sheet & Tube Co. ordered shipments resumed last week, and partial releases were granted by the Republic Steel Corp. plant at Warren, Ohio. Mahoning Valley scrap quotations are accordingly higher this week. At Cleveland blast furnace grades are about the only scrap moving.

Buffalo

Dealers and plants are marking time pending the outcome of the strike situation and the prospects for fall business. The market is quiet. Many of the foundries shut down over the Fourth. One large consumer reports having added 33,000 to 35,000 tons to its stockpile in the past week. This mill continues in the market locally, being willing to pay \$17.50 and \$15.50 for No. 1 and No. 2 steel.

Boston

A little better feeling is evinced in the market for domestic delivery due to a strengthening in prices for a few items, and a somewhat larger sounding out of the situation by consumers. Bundled skeleton prices are up about 40c. a ton and there has been a sympathetic advance in heavy melting steel quotations. The last shipments of steel turnings to Weirton were at \$7.80 a ton, f.o.b. Eastern Pennsylvania consumers now offer \$8.10 a ton on cars for shipments this week. Foundry buying of machinery and textile cast is still very slow.

New York

The market tone is much stronger, but there have been practically no new sales into consumption that would justify a change in prices. All brokers agree, however, that there is an artificial restriction in the supply at present figures and that buying prices will have to be raised in order to attract material in any quantity into the yards. It will probably take another boost in the Philadelphia and Pittsburgh lists to move this market up sympathetically, in view of present freight differentials. Export demand is still listless, but it would not be surprising to see Japan enter the scrap market again by mid-July.

Cincinnati

The improved strike situation has brought a better undertone to the old materials market. While mill buying is almost absent, dealers are in more hopeful mood and anticipate early improvement in demand. Current activity is solely among dealers to build yard supplies and apply on old contracts. Published prices are nominal.

St. Louis

The scrap iron situation in the country is reported to be tightening up, principally because farmers are too busy working with their crops to gather up scrap and take it to town. Dealers are waiting, also, for strike embargoes to be lifted before making offerings. Steel mills in the district closed down only for the Fourth. Sales of a small total tonnage were made of some items at lower prices.

Iron and Steel Scrap Prices

PITTSBURGH

Per gross ton delivered to consumer:	
No. 1 hvy. mtng. steel.	\$18.50 to \$19.00
Railroad hvy. mtng.	20.50 to 21.00
No. 2 hvy. mtng. steel.	16.50 to 17.00
No. 2 RR. wrought	18.50 to 19.00
Scrap rails	21.00 to 21.50
Rails 3 ft. and under..	24.00 to 24.50
Comp. sheet steel	18.50 to 19.00
Hand bundled sheets..	16.50 to 17.00
Hvy. steel axle turn....	16.75 to 17.25
Machine shop turn....	13.50 to 14.00
Short shov. turn....	14.50 to 15.00
Mixed bor. & turn....	14.50 to 15.00
Cast iron borings	14.50 to 15.00
Cast iron carwheels....	18.50 to 19.00
Hvy. breakable cast....	14.50 to 15.00
No. 1 cupola cast....	18.50 to 19.00
RR. knuckles & cplrs..	24.00 to 24.50
Rail coll & leaf springs	24.00 to 24.50
Rolled steel wheels....	24.00 to 24.50
Low phos. billet crops.	24.50 to 25.00
Low phos. sh. bar	23.50 to 24.00
Low phos. punchings....	22.00 to 22.50
Low phos. plate, hvy....	23.00 to 23.50
Low phos. plate clips..	21.00 to 21.50
Steel car axles	24.00 to 24.50

CLEVELAND

Per gross ton delivered to consumer:	
No. 1 hvy. mtng. steel.	\$17.00 to \$17.50
No. 2 hvy. mtng. steel.	16.00 to 16.50
Comp. sheet steel	16.50 to 17.00
Light bund. stampings.	12.50 to 13.00
Drop forge flashings...	16.00 to 16.50
Machine shop turn....	11.00 to 11.50
Short shov. turn....	12.00 to 12.50
No. 1 busheling	15.50 to 16.00
Steel axle turnings....	13.50 to 14.00
Low phos. billet and bloom crops	23.50 to 24.50
Cast iron borings	12.50 to 13.00
Mixed bor. & turn....	12.50 to 13.00
No. 2 busheling	12.50 to 13.00
No. 1 cast.....	19.00 to 19.50
Railroad grate bars....	11.50 to 12.00
Stove plate	9.50 to 10.00
Rails under 3 ft.	23.00 to 23.50
Rails for rollings	21.00 to 21.50
Railroad malleable	20.50 to 21.00
Cast iron carwheels....	21.50

PHILADELPHIA

Per gross ton delivered to consumer:	
No. 1 hvy. mtng. steel.	\$17.50 to \$18.00
No. 2 hvy. mtng. steel.	15.50 to 16.00
Hydraulic bund., new.	18.00 to 18.50
Hydraulic bund., old..	14.50 to 15.00
Steel rails for rolling..	21.00 to 21.50
Cast iron carwheels ..	19.50 to 20.00
Hvy. breakable cast....	18.00 to 18.50
No. 1 cast	20.00 to 20.50
Stove plate (steel wks.)	14.00 to 14.50
Railroad malleable	19.00 to 19.50
Machine shop turn....	12.50 to 13.00
No. 1 blast furnace	12.00 to 12.50
Cast borings	11.50 to 12.00
Heavy axle turnings....	15.00 to 15.50
No. 1 low phos. hvy....	23.50 to 24.00
Couplers & knuckles..	23.50 to 24.00
Rolled steel wheels ...	23.00 to 23.50
Steel axles	25.50 to 26.00
Shafting	23.50 to 24.00
No. 1 RR. wrought	19.50 to 20.00
Spec. iron & steel pipe	16.50 to 17.00
No. 1 forge fire	16.00 to 16.50
Cast borings (chem.)..	14.00 to 14.50

CHICAGO

Delivered to Chicago district consumers:	
	Per Gross Ton
Hvy. mtng. steel.....	\$15.50 to \$16.00
Auto. hvy. mtng. steel, alloy free	14.50 to 15.00
No. 2 auto. steel	12.00 to 12.50
Shoveling steel	15.50 to 16.00
Hydraul. comp. sheets.	14.50 to 15.00
Drop forge flashings...	13.50 to 14.00
No. 1 busheling	14.50 to 15.00
Rolled carwheels	19.50 to 20.00
Railroad tires, cut	21.50 to 22.00
Railroad leaf springs..	21.00 to 21.50
Steel coup. & knuckles	19.50 to 20.00
Axle turnings	15.00 to 15.50
Coil springs	22.00 to 22.50
Axle turn. (elec.)	15.50 to 16.00
Low phos. punchings..	20.00 to 20.50
Low phos. plates, 12 in. and under	20.00 to 20.50
Cast iron borings	10.00 to 10.50
Short shov. turnings....	10.50 to 11.00
Machine shop turn.	8.50 to 9.00
Rerolling rails	19.00 to 19.50
Steel rails under 3 ft..	19.50 to 20.00
Steel rails under 2 ft....	20.00 to 20.50
Angle bars, steel	19.00 to 19.50
Cast iron carwheels....	18.00 to 18.50
Railroad malleable	19.00 to 19.50
Agric. malleable	15.50 to 16.00

Per Net Ton

Iron car axles	\$24.50 to \$25.00
Steel car axles	21.50 to 22.00
No. 1 RR. wrought	14.00 to 15.00
No. 2 RR. wrought	14.00 to 15.00
No. 2 busheling, old..	8.50 to 9.00
Locomotive tires	18.00 to 18.50
Pipes and flues	13.50 to 14.00
No. 1 machinery cast....	15.00 to 15.50
Clean auto. cast.	14.00 to 14.50
No. 1 railroad cast....	14.00 to 14.50
No. 1 agric. cast.....	13.00 to 13.50
Stove plate	10.50 to 11.00
Grate bars	12.00 to 12.50
Brake shoes	11.00 to 11.50

BUFFALO

Per gross ton, f.o.b. consumers' plants:	
No. 1 hvy. mtng. steel.	\$17.00 to \$17.50
No. 2 hvy. mtng. steel.	15.50 to 16.00
Scrap rails	18.50 to 19.00
New hvy. b'ndled sheet	15.50 to 16.00
Old hydraul. bundles ..	15.00 to 15.50
Drop forge flashings ..	15.50 to 16.00
No. 1 busheling	15.50 to 16.00
Hvy. axle turnings....	13.00 to 13.50
Machine shop turn.	11.00 to 11.50
Knuckles & couplers...	20.00 to 21.00
Coil & leaf springs....	20.00 to 21.00
Rolled steel wheels....	20.00 to 21.00
Low phos. billet crops.	20.50 to 21.00
Shov. turnings	12.00 to 12.50
Mixed bor. & turn....	10.50 to 11.00
Cast iron borings	10.50 to 11.00
Steel car axles	19.50 to 20.00
No. 1 machinery cast....	17.50 to 18.00
No. 1 cupola cast....	16.50 to 17.00
Stove plate	14.00 to 14.50
Steel rails under 3 ft..	20.50 to 21.00
Cast iron carwheels....	16.50 to 17.00
Railroad malleable	18.50 to 19.00
Chemical borings	11.00 to 11.50

BIRMINGHAM

Per gross ton delivered to consumer:	
Hvy. melting steel	\$16.00 to \$16.50
Scrap steel rails	17.00
Short shov. turnings...	9.00 to 10.00
Stove plate	10.00
Steel axles	18.00 to 19.00
Iron axles	16.50 to 18.00
No. 1 RR. wrought....	13.00 to 15.00
Rails for rolling	18.00 to 20.00
No. 1 cast	16.00 to 18.00
Tramcar wheels	16.00 to 18.00

ST. LOUIS

Dealer's buying prices per gross ton delivered to consumer:	
Selected hvy. steel....	\$15.00 to \$15.50
No. 1 hvy. melting....	15.00 to 15.50
No. 2 hvy. melting....	13.50 to 14.00
No. 1 locomotive tires.	18.50 to 19.00
Misc. stand.-sec. rails.	16.50 to 17.00
Railroad springs	20.00 to 20.50
Bundled sheets	10.00 to 10.50
No. 2 RR. wrought	15.00 to 15.50
No. 1 busheling	12.00 to 12.50
Cast bor. & turn.	7.50 to 8.00
Rails for rolling	18.00 to 18.50
Machine shop turn....	9.00 to 9.50
Heavy turnings	12.00 to 12.50
Steel car axles	21.50 to 22.00
Iron car axles	22.00 to 22.25
No. 1 RR. wrought	12.00 to 12.50
Steel rails under 3 ft..	18.50 to 19.00
Steel angle bars	17.50 to 18.00
Cast iron carwheels....	17.00 to 17.50
No. 1 machinery cast....	14.00 to 14.50
Railroad malleable	18.00 to 18.50
No. 1 railroad cast....	14.00 to 14.50
Stove plate	11.00 to 11.50
Agricul. malleable	12.50 to 13.00
Grate bars	11.50 to 12.00
Brake shoes	11.50 to 12.00

CINCINNATI

Dealer's buying prices per gross ton:	
No. 1 hvy. mtng. steel.	\$14.25 to \$14.75
No. 2 hvy. mtng. steel.	11.75 to 12.25
Scrap rails for mtng. ..	17.50 to 18.00
Loose sheet clippings...	10.25 to 10.75
Hydraul. b'ndled sheets.	13.75 to 14.25
Cast iron borings	8.00 to 8.50
Machine shop turn....	8.50 to 9.00
No. 1 busheling	12.50 to 13.00
No. 2 busheling	6.00 to 6.50
Rails for rolling	19.50 to 20.00
No. 1 locomotive tires.	15.50 to 16.00
Short tails	19.50 to 20.00
Cast iron carwheels....	14.50 to 15.00
No. 1 machinery cast....	14.00 to 14.50
No. 1 railroad cast....	14.00 to 14.50
Burnt cast	9.50 to 10.00
Stove plate	9.50 to 10.00
Agricul. malleable	15.00 to 15.50
Railroad malleable	16.25 to 16.75
Mixed hvy. cast.....	12.00 to 12.50

DETROIT

Dealers' buying prices per gross ton:	
No. 1 hvy. mtng. steel.	\$15.00 to \$15.50
No. 2 hvy. mtng. steel..	14.00 to 14.50
Borings and turnings...	10.25 to 10.75
Long turnings	9.50 to 10.00
Short shov. turnings...	10.50 to 11.00
No. 1 machinery cast....	15.00 to 15.50
Automotive cast	15.50 to 16.00
Hydraul. comp. sheets.	16.00 to 16.50
Stove plate	9.50 to 10.00
New factory bushel....	14.50 to 15.00
Old No. 2 busheling....	10.00 to 10.50
No. 2 busheling (black fender stock)	12.00 to 12.50
Sheet clippings	11.00 to 11.50
Flashings	13.75 to 14.25
Low phos. plate scrap.	15.00 to 15.50

YOUNGSTOWN

Per gross ton delivered to consumer:	
No. 1 hvy. mtng. steel.	\$18.00 to \$18.50
Hydraulic bundles	17.50 to 18.00
Machine shop turn.	13.00 to 13.50

NEW YORK

Dealers' buying prices per gross ton:	
No. 1 hvy. mtng. steel.	\$14.50 to \$15.00
No. 2 hvy. mtng. steel.	13.50 to 14.00
Hvy. breakable cast....	14.00 to 14.50
No. 1 machinery cast....	15.00 to 15.50
No. 2 cast.....	14.00 to 14.50
Stove plate	11.00 to 11.50
Steel car axles	24.50 to 25.50
Shafting	19.00 to 19.50
No. 1 RR. wrought....	17.00 to 17.50
No. 1 wrought long....	16.00 to 16.50
Spec. iron & steel pipe.	12.50 to 13.00
Rails for rolling.....	18.50 to 19.00
Clean steel turnings ..	9.00 to 9.50
Cast borings	8.50 to 9.00
No. 1 blast furnace	8.50 to 9.00
Cast borings (chem.)..	12.00 to 12.50
Unprepar. yard scrap..	9.00 to 9.50
Per gross ton, delivered local foundries:	
No. 1 machn. cast....	\$17.50 to \$18.00
No. 1 hvy. cast cupola..	15.00 to 15.50
No. 2 cast	14.50 to 15.00

BOSTON

Dealers' buying prices per gross ton:	
No. 1 hvy. mtng. steel.	\$13.55
Scrap rails	13.55
No. 2 steel	12.50
Breakable cast.	13.25
Machine shop turn....	\$8.10 to 8.25
Mixed bor. & turn....	8.10 to 8.25
Bund. skeleton long....	11.25 to 11.30
Shafting	18.00 to 18.25
Cast bor. chemical....	9.50 to 10.25
Per gross ton delivered consumers' yards:	
Textile cast.....	\$17.00 to \$18.00
No. 1 machine cast....	18.00
Stove plate	10.00 to 10.50

CANADA

Dealers' buying prices at their yards, per gross ton	
	Toronto Montreal
No. 1 hvy. mtng. stl....	\$12.50 \$13.00
No. 2 hvy. mtng. stl....	11.50 12.00
Mixed dealers steel....	11.00 11.75
Scrap pipe	10.00 9.75
Steel turnings	8.00 8.50
Cast borings	9.25 9.50
Machinery cast.	16.00 17.00
Dealers cast.	14.00 15.00
Stove plate	12.00 12.75

EXPORT

Dealers' buying prices per gross ton:	
<i>New York, truck lots, delivered, barges.</i>	
No. 1 hvy. mtng. steel.	\$15.00
No. 2 hvy. mtng. steel.	14.00
No. 2 cast.....	13.00
Stove plate	10.00

Boston on cars at Army Base or Mystic Wharf

No. 1 hvy. mtng. steel.	\$16.00
No. 2 hvy. mtng. steel.	15.00
Rails (scrap)	16.00

Philadelphia, delivered alongside boats, Port Richmond

No. 1 hvy. mtng. steel	\$17.00*
No. 2 hvy. mtng. steel	15.00*

* Nominal.

New Orleans, f.o.b., Stuyvesant Dock

No. 1 hvy. mtng. steel.	\$17.50
No. 2 hvy. mtng. steel.	16.50
<i>Los Angeles, on cars or trucks at local piers</i>	
No. 1 hvy. mtng. steel.	\$10.50 to \$11.00
Compressed bundles ..	3.50 to 3.90

PRICES ON FINISHED AND SEMI-FINISHED IRON AND STEEL

SEMI-FINISHED STEEL

Billets, Blooms and Slabs

F.o.b. Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham. Prices at Duluth are \$2 a ton higher, and delivered Detroit \$3 higher.

Per Gross Ton

Rerolling\$37.00
Forging quality 43.00

Sheet Bars

F.o.b. Pittsburgh, Chicago, Cleveland, Youngstown, Buffalo, Canton, Sparrows Point, Md.

Per Gross Ton

Open-hearth or Besse-
mer\$37.00

Skelp

F.o.b. Pittsburgh, Chicago, Youngstown, Buffalo, Coatesville, Pa., Sparrows Point, Md.

Per Lb.

Grooved, universal and
sheared2.10c.

Wire Rods

(No. 5 to 9/32 in.)

Per Gross Ton

F.o.b. Pittsburgh or Cleveland.....\$47.00
F.o.b. Chicago, Youngstown or
Anderson, Ind. 48.00
F.o.b. Worcester, Mass. 49.00
F.o.b. Birmingham 50.00
F.o.b. San Francisco 56.00
F.o.b. Galveston 53.00
Rods over 9/32 in. to 47/64 in., in-
clusive, \$5 a ton over base.

BARS, PLATES, SHAPES

Iron and Steel Bars

Soft Steel

Base per Lb.

F.o.b. Pittsburgh2.45c.
F.o.b. Chicago or Gary2.50c.
F.o.b. Duluth2.60c.
Del'd Detroit2.60c.
F.o.b. Cleveland2.50c.
F.o.b. Buffalo2.55c.
Del'd Philadelphia2.74c.
Del'd New York2.78c.
F.o.b. Birmingham2.60c.
F.o.b. cars dock Gulf ports....2.85c.
F.o.b. cars dock Pacific ports....3.00c.

Rail Steel

(For merchant trade)

F.o.b. Pittsburgh2.30c.
F.o.b. Cleveland, Chicago, Gary
or Moline, Ill.2.35c.
F.o.b. Buffalo2.40c.
F.o.b. Birmingham2.45c.
F.o.b. cars dock Gulf ports....2.70c.
F.o.b. cars dock Pacific ports....2.85c.

Billet Steel Reinforcing (Straight lengths as quoted by distributors)

F.o.b. Pittsburgh2.55c.
F.o.b. Buffalo, Cleveland,
Youngstown, Chicago, Gary
or Birmingham2.60c.
Del'd Detroit2.70c.
F.o.b. cars dock Gulf ports....2.95c.
F.o.b. cars dock Pacific ports....2.95c.

Rail Steel Reinforcing (Straight lengths as quoted by distributors)

F.o.b. Pittsburgh2.40c.
F.o.b. Buffalo, Cleveland,
Youngstown, Chicago, Gary
or Birmingham2.45c.
F.o.b. cars dock Gulf ports....2.80c.
F.o.b. cars dock Pacific ports....2.80c.

Iron

F.o.b. Chicago2.40c.
F.o.b. Pittsburgh (refined)3.60c.

Cold Finished Bars and Shafting*

Base per Lb.

F.o.b. Pittsburgh2.90c.
F.o.b. Cleveland, Chicago and
Gary2.95c.
F.o.b. Buffalo3.00c.
F.o.b. Detroit2.95c.

* In quantities of 10,000 to 19,999 lb.

Plates

Base per Lb.

F.o.b. Pittsburgh2.25c.
F.o.b. Chicago or Gary2.30c.
Del'd Cleveland2.435c.
F.o.b. Coatesville or Spar. Pt.2.35c.
Del'd Philadelphia2.435c.
Del'd New York2.53c.
F.o.b. Birmingham2.40c.

F.o.b. cars dock Gulf ports....2.65c.
F.o.b. cars dock Pacific ports....2.80c.
Wrought iron plates, f.o.b.
Pittsburgh3.80c.

Floor Plates

F.o.b. Pittsburgh3.80c.
F.o.b. Chicago3.85c.
F.o.b. Coatesville3.90c.
F.o.b. cars dock Gulf ports....4.20c.
F.o.b. cars dock Pacific ports....4.35c.

Structural Shapes

Base per Lb.

F.o.b. Pittsburgh2.25c.
F.o.b. Chicago2.30c.
Del'd Cleveland2.435c.
F.o.b. Buffalo or Bethlehem...2.35c.
Del'd Philadelphia2.455c.
Del'd New York2.5025c.
F.o.b. Birmingham (standard) 2.40c.
F.o.b. cars dock Gulf ports....2.65c.
F.o.b. cars dock Pacific ports....2.80c.

Steel Sheet Piling

Base per Lb.

F.o.b. Pittsburgh2.60c.
F.o.b. Chicago or Buffalo2.70c.
F.o.b. cars dock Gulf or Pacific
Coast ports3.05c.

RAILS AND TRACK SUPPLIES

F.o.b. Mill

Standard rails, heavier than
60 lb., per gross ton\$42.50
Angle bars, per 100 lb. 2.80

F.o.b. Basing Points

Light rails (from billets) per
gross ton\$43.00
Light rails (from rail steel) per
gross ton 42.00

Base per Lb.

Spikes3.15c.
Tie plates, steel2.30c.
Tie plates, Pacific Coast ports. 2.40c.
Track bolts, to steam railroads. 4.35c.
Track bolts, to jobbers, all sizes
(per 100 counts) 65-5 per cent off list

Basing points on light rails are Pittsburgh, Chicago and Birmingham; on spikes and tie plates, Pittsburgh, Chicago, Portsmouth, Ohio, Weirton, W. Va., St. Louis, Kansas City, Minnequa, Colo., Birmingham and Pacific Coast ports; on tie plates alone, Steelton, Pa., Buffalo; on spikes alone, Youngstown, Lebanon, Pa., Richmond, Va.

SHEETS, STRIP, TIN PLATE

TERNE PLATE

Sheets

Hot Rolled

Base per Lb.

No. 10, f.o.b. Pittsburgh2.40c.
No. 10, f.o.b. Gary2.50c.
No. 10, del'd Detroit2.60c.
No. 10, del'd Philadelphia2.69c.
No. 10, f.o.b. Granite City2.60c.
No. 10, f.o.b. Birmingham2.55c.
No. 10, f.o.b. cars dock Pacific
ports2.95c.
No. 10 wrought iron, Pgh.4.25c.

Hot-Rolled Annealed

No. 24, f.o.b. Pittsburgh3.15c.
No. 24, f.o.b. Gary3.25c.
No. 24, del'd Detroit3.35c.
No. 24, del'd Philadelphia3.44c.
No. 24, f.o.b. Granite City3.35c.
No. 24, f.o.b. Birmingham3.30c.
No. 24, f.o.b. cars dock Pacific
ports3.80c.
No. 24, wrought iron, Pitts-
burgh5.15c.

Heavy Cold-Rolled

No. 10 gage, f.o.b. Pittsburgh. 3.10c.
No. 10 gage, f.o.b. Gary3.20c.
No. 10 gage, f.o.b. Detroit3.30c.
No. 10 gage, del'd Philadelphia. 3.39c.
No. 10, f.o.b. Granite City3.30c.
No. 10 gage, f.o.b. Birmingham. 3.25c.
No. 10 gage, f.o.b. cars dock
Pacific ports3.70c.

Light Cold-Rolled

No. 20 gage, f.o.b. Pittsburgh.. 3.55c.
No. 20 gage, f.o.b. Gary3.65c.
No. 20 gage, del'd Detroit3.75c.
No. 20 gage, del'd Philadelphia. 3.84c.
No. 20, f.o.b. Granite City3.75c.
No. 20 gage, f.o.b. Birmingham. 3.70c.
No. 20 gage, f.o.b. cars, dock,
Pacific ports4.10c.

Galvanized Sheets

No. 24 gage, f.o.b. Pittsburgh. 3.80c.
No. 24, f.o.b. Gary3.90c.
No. 24, del'd Philadelphia4.09c.
No. 24, f.o.b. Granite City4.00c.

No. 24, f.o.b. Birmingham3.95c.
No. 24, f.o.b. cars, dock, Pacific
ports4.40c.
No. 24, wrought iron, Pitts-
burgh6.10c.

Electrical Sheets

(F.o.b. Pittsburgh)

Base per Lb.

Field grade3.35c.
Armature3.70c.
Electrical4.20c.
Special Motor5.10c.
Special Dynamo5.80c.
Transformer6.30c.
Transformer Special7.30c.
Transformer Extra Special7.80c.

Base gage changed from 28 to 24 gage. Gage extras are the same as those applying on hot-rolled, annealed sheets with few exceptions.
Silicon Strip in coils—Sheet price plus silico-
con sheet extra width extras plus 25c. per 100
lb. for coils.

Long Ternes

No. 24, unassorted 8-lb. coating
f.o.b. Pittsburgh4.10c.
F.o.b. Gary4.20c.
F.o.b. cars, dock, Pacific ports 4.80c.

Vitreous Enameling Stock

No. 20, f.o.b. Pittsburgh3.50c.
No. 20, f.o.b. Gary3.60c.
No. 20, f.o.b. Granite City3.70c.
No. 20, f.o.b. cars dock Pacific
ports4.10c.

Tin Mill Black Plate

No. 28, f.o.b. Pittsburgh, per
lb.3.30c.
No. 28, Gary3.40c.
No. 28, f.o.b. Granite City3.50c.
No. 28, cars dock Pacific ports,
boxed4.175c.

Tin Plate

Base per Box

Standard cokes, f.o.b. Pitts-
burgh district mill\$5.35
Standard cokes, f.o.b. Gary 5.45
Standard coke, f.o.b. Granite
City 5.55

Above quotations practically the
equivalent of previous quotations
owing to new method of quoting,
effective Jan. 1, 1937.

Special Coated Manufacturing Ternes

Base per Box

F.o.b. Pittsburgh\$4.65
F.o.b. Gary 4.75
F.o.b. Granite City 4.85

* Customary 7½ per cent discount in effect
through 1936 discontinued as of Jan. 1, 1937.

Terne Plate

(F.o.b. Pittsburgh)

(Per Package, 112 sheets, 20 x 28 in.)
8-lb. coating I.C.\$11.00
15-lb. coating I.C. 13.00
20-lb. coating I.C. 14.00
25-lb. coating I.C. 15.00
30-lb. coating I.C. 16.25
40-lb. coating I.C. 18.50

Hot-Rolled Hoops, Bands, Strip and Flats under ¼ in.

Base per Lb.

All widths up to 24 in., Pitts-
burgh2.40c.
All widths up to 24 in., Chicago 2.50c.
All widths up to 24 in., del'd
Detroit2.60c.
All widths up to 24 in., Granite
City2.60c.
All widths up to 24 in.,
Birmingham2.55c.
Cooperage stock, Pittsburgh... 2.50c.
Cooperage stock, Chicago 2.60c.

Cold-Rolled Strip*

Base per Lb.

F.o.b. Pittsburgh3.20c.
F.o.b. Cleveland3.20c.
Del'd Chicago3.48c.
F.o.b. Worcester3.40c.

* Carbon 0.25 and less.

Cold Rolled Spring Steel

Pittsburgh

and

Cleveland Worcester

Carbon 0.25-0.50% 3.20c. 3.40c.
Carbon .51-.75 4.45c. 4.65c.
Carbon .76-1.00 6.30c. 6.50c.
Carbon Over 1.00 8.50c. 8.70c.

Fender Stock

No. 14, Pitts'gh or Cleveland 3.45c.
No. 20, Pitts'gh or Cleveland. 3.85c.

WIRE PRODUCTS

(Carload lots, f.o.b. Pittsburgh and Cleveland)

To Manufacturing Trade

Per Lb.
Bright wire 2.90c.
Spring wire 3.50c.
Chicago prices on products sold to the manufacturing trade are \$1 a ton above Pittsburgh or Cleveland. Worcester and Duluth prices are \$2 a ton above, Birmingham \$3 above, and Pacific Coast prices \$3 a ton above Pittsburgh or Cleveland.

To the Trade

Base per Keg
Standard wire nails \$2.75
Smooth coated nails \$2.75
Cut nails, carloads \$3.60

Base per 100 Lb.

Annealed fence wire \$3.20
Galvanized fence wire 3.60
Polished staples 3.45
Galvanized staples 3.70
Barbed wire, galvanized 3.40
Twisted barbed wire 3.40
Woven wire fence, base column. 74
Single loop bale ties, base col. 63

Chicago and Anderson, Ind., mill prices are \$1 a ton over Pittsburgh base (on all products except woven wire fence, for which the Chicago price is \$2 above Pittsburgh); Duluth, Minn., mill prices are \$2 a ton over Pittsburgh, except for woven wire fence, which is \$3 over Pittsburgh and Birmingham mill prices are \$3 a ton over Pittsburgh.

On wire nails, barbed wire and staples, prices at Houston, Galveston and Corpus Christi, Tex., New Orleans, Lake Charles, La., and Mobile, Ala., are \$6 a ton over Pittsburgh.
On nails, staples and barbed wire, prices of \$6 a ton above Pittsburgh are also quoted at Beaumont and Orange, Tex.

STEEL AND WROUGHT IRON PIPE AND TUBING

Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills
F.o.b. Pittsburgh only on wrought iron pipe.

Butt Weld		Wrought Iron	
In.	Black Galv.	In.	Black Galv.
1/4	52 31	1/4 & 1/2	+13 +35
1/2	55 38 1/2	1/2	20 1 1/2
3/4	59 49	3/4	26 8
1	62 53	1 & 1 1/4	30 14
1 to 3	64 55 1/2	1 1/2	34 16 1/2
2	57 47 1/2	2	33 16
2 1/2 & 3	60 50 1/2	2 1/2 to 3 1/2	27 12 1/2
3 1/2 to 6	62 52 1/2	4	29 16
7 & 8	61 50 1/2	4 1/2 to 8	28 15
9 & 10	60 50	9 to 12	24 10
11 & 12	59 49		

Butt Weld, extra strong, plain ends
1/4 50 36 1/2
1/2 to 3/4 52 40 1/2
3/4 57 48 1/2
1 61 52 1/2
1 to 3 63 55

Lap Weld, extra strong, plain ends
2 55 46 1/2
2 1/2 & 3 59 50 1/2
3 1/2 to 6 62 54
7 & 8 61 51
9 & 10 60 50
11 & 12 59 49

On butt-weld and lap-weld steel pipe jobbers are granted a discount of 5%. On less-than-carload shipments prices are determined by adding 25 and 30% and the carload freight rate to the base card.

Note—Chicago district mills have a base two points less than the above discounts. Chicago delivered base is 2 1/2 points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point producing the lowest price to destination.

Boiler Tubes

Seamless Steel Commercial Boiler Tubes and Locomotive Tubes

(Net base prices per 100 ft. f.o.b. Pittsburgh in carload lots)

Cold Drawn		Hot Rolled	
In.	o.d.	In.	o.d.
1	13 B.W.G.	1	13 B.W.G.
1 1/4	13 B.W.G.	1 1/4	13 B.W.G.
1 1/2	13 B.W.G.	1 1/2	13 B.W.G.
1 3/4	13 B.W.G.	1 3/4	13 B.W.G.
2	13 B.W.G.	2	13 B.W.G.
2 1/4	13 B.W.G.	2 1/4	13 B.W.G.
2 1/2	13 B.W.G.	2 1/2	13 B.W.G.
2 3/4	13 B.W.G.	2 3/4	13 B.W.G.
3	13 B.W.G.	3	13 B.W.G.
3 1/4	13 B.W.G.	3 1/4	13 B.W.G.
3 1/2	13 B.W.G.	3 1/2	13 B.W.G.
3 3/4	13 B.W.G.	3 3/4	13 B.W.G.
4	13 B.W.G.	4	13 B.W.G.
5	9 B.W.G.	5	9 B.W.G.
6	7 B.W.G.	6	7 B.W.G.

Extra for less-carload quantities:
25,000 lb. or ft. to 39,999 lb. or ft. 5 %
12,000 lb. or ft. to 24,999 lb. or ft. 12 1/2 %
6,000 lb. or ft. to 11,999 lb. or ft. 25 %
2,000 lb. or ft. to 5,999 lb. or ft. 25 %
Under 2,000 lb. or ft. 50 %

CAST IRON WATER PIPE

Per Net Ton
*6-in. and larger, del'd Chicago. \$55.00
6-in. and larger, del'd New York 53.00
*6-in. and larger, Birmingham. 47.00
6-in. and larger, f.o.b. dock, San Francisco or Los Angeles. 56.00
F.o.b. dock, Seattle. 56.00
4-in., f.o.b. dock, San Francisco or Los Angeles 59.00
F.o.b. dock, Seattle 59.00

Class "A" and gas pipe, \$3 extra.
4-in. pipe is \$3 a ton above 6-in.

Prices for lots of less than 200 tons. For 200 tons and over, 6-in. and larger is \$46, Birmingham, and \$54 delivered Chicago; and 4-in. pipe, \$49, Birmingham, and \$58 delivered Chicago.

BOLTS, NUTS, RIVETS, SET SCREWS

Bolts and Nuts

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

Per Cent Off List

Machine and carriage bolts:
1/2 in. x 6 in. and smaller. 65 and 5*
Larger and longer up to
1 in. 60 and 10*
1 1/2 in. and larger. 50 and 5*
Lag bolts 60 and 10*
Flow bolts, Nos. 1, 2, 3
and 7 65 and 5
Hot pressed nuts, and c.p.c.
and t nuts, square or hex.
blank or tapped:
1/2 in. and smaller. 65
9/16 in. to 1 in. inclusive. 60 and 5
1 1/2 in. and larger 60

Jobbers discount on above items, 5 per cent.

* Less carload lots and less than full container quantity. Less carload lots in full container quantity, an additional 10 per cent discount; carload lots and full container quantity, still another 5 per cent discount.

Semi-finished hexagon nuts, U.S.S. and S.A.E.:

1/2 in. and smaller 60 and 10
9/16 in. to 1 in. inclusive. 60 and 5
1 1/2 in. and larger 60
Stove bolts in packages, nuts attached 72 1/2
Stove bolts in packages, with nuts separate 72 1/2 and 5
Stove bolts in bulk 80

On stove bolts freight is allowed to destination on 200 lb. and over.

Large Rivets

(1/2-in. and larger)

Base per 100 Lbs.

F.o.b. Pittsburgh or Cleveland. \$3.60
F.o.b. Chicago or Birmingham. \$3.70

Small Rivets

(7/16-in. and smaller)

Per Cent Off List

F.o.b. Pittsburgh 65 and 5
F.o.b. Cleveland 65 and 5
F.o.b. Chicago and Birmingham 65 and 5

Cap and Set Screws

(Freight allowed up to but not exceeding 65c. per 100 lb. on lots of 200 lb. or more)

Per Cent Off List

Milled cap screws, 1 in. dia. and smaller 60 and 10
Milled standard set screws, case hardened, 1 in. dia. and smaller 75
Milled headless set screws, cut thread 1/2 in. and smaller. 75
Upset hex. head cap screws U.S.S. or S.A.E. thread, 1 in. and smaller 60
Upset set screws, cup and oval points 75
Milled studs 65

Alloy and Stainless Steel

Alloy Steel Blooms, Billets and Slabs

F.o.b. Pittsburgh, Chicago, Canton, Massillon, Buffalo, Bethlehem.
Base price, \$60 a gross ton.

Alloy Steel Bars

F.o.b. Pittsburgh, Chicago, Buffalo, Bethlehem, Massillon or Canton.
Open-hearth grade, base 3.00c.
Delivered, Detroit 3.15c.

S.A.E. Alloy Series
Numbers
200 (1/4% Nickel) \$0.35
2100 (1 1/4% Nickel) 0.75
2300 (3/4% Nickel) 1.55

2500 (5% Nickel) \$2.25
3100 Nickel-chromium 0.70
3200 Nickel-chromium 1.35
3300 Nickel-chromium 3.50
3400 Nickel-chromium 3.30
4100 Chromium-molybdenum (0.15 to 0.25 Molybdenum). 0.55
4100 Chromium-molybdenum (0.25 to 0.40 Molybdenum). 0.75
4600 Nickel-molybdenum (0.30 to 0.30 Mo, 1.50 to 2.00 Ni.) 1.10
5100 Chrome steel (0.60-0.90 Cr.) 0.35
5100 Chrome steel (0.80-1.10 Cr.) 0.45
5100 Chromium spring steel. 0.15
5100 Chromium-vanadium bar. 1.30
6100 Chromium-vanadium spring steel 0.35
Chromium-nickel-vanadium 1.50
Carbon-vanadium 0.35

These prices are for hot-rolled steel bars. The differential for most grades in electric furnace steel is 50c. higher. Slabs with a section area of 16 in. and 2 1/4 in. thick or over take the billet base.

Alloy Cold-Finished Bars

F.o.b. Pittsburgh, Chicago, Gary, Cleveland or Buffalo, 3.60c. base per lb. Delivered Detroit, 3.75c., carlots.

CORROSION & HEAT RESISTANT ALLOYS

(Base prices, cents per lb., f.o.b. Pittsburgh)

Chrome-Nickel
No. 304 No. 302
Forging billets 21.25c. 20.40c.
Bars 25c. 24c.
Plates 29c. 27c.
Structural shapes 25c. 24c.
Sheets 36c. 34c.
Hot-rolled strip .. 23.50c. 21.50c.
Cold-rolled strip .. 30c. 28c.
Drawn wire 25c. 24c.

Straight Chrome

No. 410 No. 430 No. 442 No. 446
Bars .. 18.50c. 19c. 22.50c. 27.50c.
Plates .. 21.50c. 22c. 25.50c. 30.50c.
Sheets .. 26.50c. 29c. 32.50c. 36.50c.
Hot strip 17c. 17.50c. 23c. 28c.
Cold stp. 22c. 22.50c. 28.50c. 36.50c.

TOOL STEEL

High speed 67c.
High-carbon-chrome 43c.
Oil-hardening 24c.
Special 32c.
Extra 18c.
Regular 14c.
Prices for warehouse distribution to all points on or East of Mississippi River are 2c. a lb. higher. West of Mississippi quotations are 3c. a lb. higher.

British and Continental BRITISH

Per Gross Ton
f.o.b. United Kingdom Ports

Ferromanganese, export £20 Nominal
Tin plate, per base box 25s. to 25s. 6d.
Steel bars, open-hearth. £11
Beams, open-hearth. £10 12s. 6d.
Channels, open-hearth. £10 12s. 6d.
Angles, open-hearth £10 12s. 6d.
Black sheets, No. 24
gauge £15
Galvanized sheets, No. 24
gauge £18 15s.

CONTINENTAL

Per Metric Ton, Gold £,
f.o.b. Continental Ports

Current dollar equivalent is ascertained by multiplying gold pound prices by 124.14 to obtain franc equivalent and then converting at present rate of dollar-france exchange.
Billets, Thomas £4 7s. 6d.
Wire rods, No. 5 B.W.G. £5 2s. 6d.
Steel bars, merchant £5
Sheet bars £4 8s. 6d.
Plate 1/2 in. and up. £6 7s.
Plate 3/16 in. and 5 mm. £6 13s.
Sheet, 1/2 in. £7 9s. 6d.
Beams, Thomas £4 18s.
Angles (Basic) £4 18s.
Hoops and strip, base £6

IRON AND STEEL WAREHOUSE PRICES

PITTSBURGH*

Per Net Ton	
Plates	3.70c.
Structural shapes	3.70c.
Soft steel bars and small shapes	3.80c.
Reinforcing steel bars	3.80c.
Cold-finished and screw stock:	
Rounds and hexagons	4.15c.
Squares and flats	4.15c.
Hot rolled strip incl. 3/16 in. thick, under 24 in. wide	4.00c.
Hoops	4.50c.
Hot-rolled annealed sheets (No. 24), 10 or more bundles	4.50c.
Galv. sheets (No. 24), 10 or more bundles	5.15c.
Hot-rolled sheets (No. 10)	3.75c.
Galv. corrug. sheets (No. 28), per square (more than 3750 lb.)	\$4.48
Spikes, large	1 to 24 kegs 3.90c.

Per Cent Off List	
Track bolts, all sizes, per 100 count	55
Machine bolts, 100 count	**
Carriage bolts, 100 count	**
Nuts, all styles, 100 count	**
Large rivets, base per 100 lb.	\$4.35
Wire, black, soft ann'd, base per 100 lb.	3.45c.
Wire, galv. soft, base per 100 lb.	3.85c.
Common wire nails, per keg	3.00c.
Cement coated nails, per keg	3.00c.

On plates, structurals, bars, reinforcing bars, bands, hoops and blue annealed sheets, base applies to orders of 400 to 9999 lb.

*Delivered in Pittsburgh switching district.

**Prices on application.

CHICAGO Base per Lb.

Plates and structural shapes	3.75c.
Soft steel bars, rounds	3.85c.
Soft steel bars, squares and hexagons	4.00c.
Cold-fin. steel bars:	
Rounds and hexagons	4.30c.
Flats and squares	4.30c.
Hot-rolled strip	4.10c.
Hot-rolled annealed sheets (No. 24)	4.60c.
Galv. sheets (No. 24)	5.25c.
Spikes (keg lots)	4.40c.
Track bolts (keg lots)	5.60c.
Rivets, structural (keg lots)	4.60c.
Rivets, boiler (keg lots)	4.70c.

Per Cent Off List	
Machine bolts	*60
Carriage bolts	*60
Lag screws	*55 and 5
Hot-pressed nuts, sq. tap or blank	*60
Hot-pressed nuts, hex. tap or blank	*60
Hex. head cap screws	60
Cut point set screws	75
Flat head bright wood screws	62 and 20
Spring cotters	45
Stove bolts in full packages	72½
Rd. hd. tank rivets, 7/16 in. and smaller	55
Wrought washers	\$4.00 off list
Black ann'd wire per 100 lb. to mfg. trade (No. 14 and heavier)	\$4.55
Com. wire nails, 15 kegs or more, per keg	\$3.20
Cement c'd nails, 15 kegs or more, per keg	\$3.20

On plates, shapes, bars, hot-rolled strip and heavy hot-rolled sheets, the base applies on orders of 400 to 9999 lb. All prices are f.o.b. consumers' plants within the Chicago switching district.

*These are quotations delivered to city trade for quantities of 100 lb. or more. For lots of less than 100 lb., the quotation is 60 per cent off. Discounts applying to country trade are 70 per cent off, f.o.b. Chicago, with full or partial freight allowed up to 50c. per 100 lb.

NEW YORK

Base per Lb.	
Plates, ¼ in. and heavier	4.00c.
Structural shapes	3.97c.
Soft steel bars, round	4.12c.
Iron bars, Swed. char-coal	7.00 to 7.25c.
Cold-fin. shafting and screw stock:	
Rounds and hexagons	4.57c.
Flats and squares	4.57c.
Cold-rolled; strip, soft and quarter hard	3.92c.
Hoops	4.32c.

Bands	4.32c.
Hot-rolled sheets (No. 10)	4.00 to 4.07c.
Hot-rolled ann'd sheets (No. 24*)	4.50 to 4.82c.
Galvanized sheets (No. 24*)	5.47c.
Long terme sheets (No. 24)	5.50 to 6.20c.
Armco iron, galv. (No. 24†)	6.25c.
Toncan iron, galv. (No. 24†)	6.25c.
Galvanneal (No. 24†)	6.60c.
Armco iron, hot-rolled annealed (No. 24†)	5.65c.
Toncan iron, hot-rolled annealed (No. 24†)	5.65c.
Armco iron hot-rolled (No. 10†)	4.60c.
Toncan iron, hot-rolled (No. 10†)	4.60c.
Cold-rolled sheets (No. 20) for quantities 400 to 1499 lb.	
Standard quality	5.40c.
Deep drawing	6.05c.
Stretcher leveled	6.05c.
SAE, 2300, hot-rolled	7.82c.
SAE, 3100, hot-rolled	6.37c.
SAE, 6100, hot-rolled, annealed	10.52c.
SAE, 2300, cold-rolled	9.00c.
SAE, 3100, cold-rolled, annealed	8.55c.
Floor plate, ½ in. and heavier	5.90c.
Standard tool steel	12.50c.
Wire, black, annealed (No. 9)	4.25c.
Wire, galv. (No. 9)	4.60c.
Tire steel, 1 x ½ in. and larger	4.61c.
Open-hearth spring steel	4.75c. to 10.25c.
Common wire nails, base per keg	3.25c.

Per Cent Off List	
Machine bolts, square head and nut:	
All diameters. Prices on application	
Carriage bolts, cut thread:	
All diameters. Prices on application	

*No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb.
†125 lb. and more.

ST. LOUIS Base per Lb.

Plates and struc. shapes	3.99c.
Bars, soft steel (rounds and flats)	4.09c.
Bars, soft steel (squares, hexagons, ovals, half ovals and half rounds)	4.24c.
Cold-fin. rounds, shafting, screw stock	4.54c.
Hot-rolled annealed sheets (No. 24)	4.84c.
Galv. sheets (No. 24*)	5.49c.
Hot-rolled sheets (No. 10)	4.09c.
Black corrug. sheets (No. 24*)	4.89c.
2 galv. corrug. sheets	5.54c.
Structural rivets	4.94c.
Boiler rivets	5.04c.

Per Cent Off List	
Tank rivets, 7/16 in. and smaller	55
Machine and carriage bolts, lag screws, fitting up bolts, bolt ends, plow bolts, hot-pressed nuts, square and hexagon, tapped or blank, semi-finished nuts; all quantities	65

*No. 26 and lighter take special prices.

PHILADELPHIA

Base Per Lb.	
*Plates, ¼-in. and heavier	3.80c.
*Structural shapes	3.80c.
*Soft steel bars, small shapes, iron bars (except bands)	3.90c.
†Reinforc. steel bars, sq. twisted and deformed	3.43c.
Cold-finished steel bars	4.53c.
*Steel hoops	4.25c.
*Steel bands, No. 12 and 3/16 in. incl.	4.00c.
Spring steel	5.40c.
†Hot-rolled anneal. sheets (No. 24)	4.65c.
†Galvanized sheets (No. 24)	5.30c.
*Hot-rolled annealed sheets (No. 10)	3.90c.
Diam. pat. floor plates, ¼ in.	5.45c.

These prices are subject to quantity differential except on reinforcing and Swedish iron bars.

*Base prices subject to deduction on orders aggregating 4000 lb. or over.

†For 25 bundles or over.
†For less than 2000 lb.

CLEVELAND

Base per Lb.	
Plates and struc. shapes	3.86c.

Soft steel bars	3.75c.
†Reinforc. steel bars	2.60c.
†Cold-finished steel bars	4.30c.
Hot-rolled strip, 6 in. wide and under	4.16c.
Cold-finished strip	3.60c.
Hot-rolled annealed sheets (No. 24)	4.66c.
Galvanized sheets (No. 24)	5.31c.
Hot-rolled sheets (No. 10)	3.91c.
Hot-rolled 3/16 in. 24 to 48 in. wide sheets	3.91c.
Floor plates, 3/16 in. and heavier	5.76c.
*Black ann'd wire, per 100 lb.	\$3.40
*No. 9 galv. wire, per 100 lb.	3.80
*Com. wire nails, base per keg	2.95
Per Cent Off List	
Machine and carriage bolts, small	65 and 5
Large	60 and 10
Nuts, 100 count	65 and 5
½ in. and smaller	65 and 5
9/16 in. to 1 in.	60 and 10

†Outside delivery 10c. less.

*For 5000 lb. or less.

†Plus switching and cartage charges and quantity differentials up to 50c.

CINCINNATI Base per Lb.

Plates and struc. shapes	3.95c.
Floor plates	5.85c.
Bars, rounds, flats and angles	4.05c.
Other shapes	4.20c.
Rail steel reinforc. bars	3.75c.
Hoops and bands, 3/16 in. and lighter	4.25c.
Cold-finished bars	4.50c.
Hot-rolled annealed sheets (No. 24) 3500 lb. or more	4.60c.
Galv. sheets (No. 24) 3500 lb. or more	\$5.25
Hot-rolled sheets (No. 10)	4.00c.
Small rivets	55 per cent off list
No. 9 ann'd wire, per 100 lb. (1000 lb. or over)	\$2.83
Com. wire nails, base per keg:	
Any quantity less than carload	3.04
Cement c'd nails, base 100-lb. keg	3.50
Chain. lin. per 100 lb.	8.35

Net per 100 Ft.	
Seamless steel boiler tubes,	
2-in.	\$21.80
4-in.	\$24.45
Lap-welded steel boiler tubes,	
2-in.	20.73
4-in.	48.41

BUFFALO Base per Lb.

Plates	3.92c.
Struc. shapes	3.90c.
Soft steel bars	3.90c.
Reinforcing bars	3.10c.
Cold-fin. flats and sq.	4.35c.
Rounds and hex.	4.35c.
Cold-rolled strip steel	3.79c.
Hot-rolled annealed sheets (No. 24)	4.80c.
Heavy hot-rolled sheets (3/16 in., 24 to 48 in. wide)	3.97c.
Galv. sheet (No. 24)	5.45c.
Bands	4.22c.
Hoops	4.22c.
Heavy hot-rolled sheets	3.97c.
Com. wire nails, base per keg	\$3.26
Black wire, base per 100 lb. (2500-lb lots or under)	4.55c.
(Over 2500 lb.)	4.45c.

BOSTON Base per Lb.

Channels, angles	4.20c.
Tees and zees, under 3"	4.45c.
H beams and shapes	4.07c.
Plates — Sheared, tank and univ. mill, ¼ thick and heavier	4.08c.
Floor plates, diamond pattern	6.03c.
Bar and bar shapes (mild steel)	4.20c.
Bands 3/16 in. thick and No. 12 ga. incl.	4.40 to 5.40
Half rounds, half ovals, ovals and bevels	5.45c.
Tire steel	5.45c.
Cold-rolled strip steel	3.845c.
Cold-finished rounds, squares and hexagons	4.65c.
Cold-finished flats	4.65c.
Blue annealed sheets, No. 10 ga.	3.90c.
One pass cold-rolled sheets No. 24 ga.	4.50c.
Galvanized steel sheets, No. 24 ga.	5.05c.
Lead coated sheets, No. 24 ga.	6.15c.

Price delivered by truck in metropolitan Boston, subject to quantity differentials.

DETROIT

Base per Lb.

Soft steel bars	3.94c.
Structural shapes	3.95c.
Plates	3.95c.
Floor plates	5.85c.
Hot-rolled annealed sheets (No. 24)*	4.69c.
Hot-rolled sheets (No. 10).....	3.94c.
Galvanized sheets (No. 24)*.....	5.40c.
Bands and hoops	4.19c.
Cold-finished bars	4.30c.
Cold-rolled strip	3.78c.
Hot-rolled alloy steel (S.A.E. 3100 Series)	6.44c.
Quantity differential on bars, plates, structural shapes, bands, hoops, floor plates and heavy hot- rolled: Under 100 lb., 1.50c. over base; 100 to 399 lb., base plus .50c.; 400 to 3999 lb. base; 4000 to 9999 lb., base less .10c.; 10,000 lb. and over, less .15c.	

* Under 400 lb., .50c. over base;
400 to 1499 lb., base; 1500 to 3499 lb.,
base less .10c.; 3500 lb. and over, base
less .15c.

Prices delivered by truck in metro-
politan Detroit, subject to quantity
differentials covering shipment at
one time.

Galvanized and hot-rolled annealed
may not be combined to obtain quan-
tity deductions.

MILWAUKEE

Base per Lb.

Plates and structural shapes..	3.86c.
Soft steel bars, rounds up to 8 in., flats and fillet angles...	3.96c.
Soft steel bars, squares and hexagons	4.11c.
Hot-rolled strip	4.21c.
Hot-rolled annealed sheets (No. 24)	4.71c.
Galvanized sheets (No. 24).....	5.36c.
Cold-finished steel bars	4.41c.
Structural rivets (keg lots).....	4.81c.
Boiler rivets, cone head (keg lots)	4.91c.
Track spikes (keg lots)	4.61c.
Track bolts (keg lots).....	5.81c.
Black annealed wire (No. 6 to No. 9 incl.)	4.05c.
Com. wire nails and cement coated nails 1 to 14 kegs	3.25c.

Per Cent Off List

Machine bolts and carriage bolts, 1/2x6 and smaller or shorter....	65
Larger and longer up to 1 in., diam.	60-5
1 1/2 in. and larger	60
Coach and lag screws	60-5
Hot-pressed nuts, sq. and hex. tapped or blank, 1-199 lb.....	50
200 lb. and over:	
1/2 in. and smaller	65
9/16 to 1 in.	60-5
1 1/2 in. and over	50-10

Prices given above are delivered
Milwaukee.

On plates, shapes, bars, hot-rolled
strip and heavy hot-rolled sheets,
the base applies on orders of 400 to
3999 lb. On galvanized and No. 24
hot-rolled annealed sheets the prices
given apply on orders of 400 to 1500
lb. On cold-finished bars the prices
are for orders of 1000 lb. or more of
a size.

ST. PAUL

Base per Lb.

Mild steel bars, rounds	4.10c.
Structural shapes	4.00c.
Plates	4.00c.
Cold-finished bars	4.55c.
Hot-rolled annealed sheets, No. 24	4.85c.
Galvanized sheets, No. 24.....	5.50c.

On mild steel bars, shapes and
plates the base applies on 400 to
14,999 lb. On hot-rolled sheets, gal-
vanized sheets and cold-rolled sheets
base applies on 15,000 lb. and over.
Base on cold-finished bars is 1000
lb. and over of a size.

BALTIMORE

Base per Lb.

Mild steel bars and small shapes	4.00c.
Structural shapes	3.90c.
Reinforcing bars, 5 to 15 tons.	3.16c.
Plates	3.90c.
Hot-rolled sheets, No. 10	3.95c.
Bands	4.20c.
Hoops	4.45c.
Special threading steel	4.15c.
Checkered floor plates 1/4 in. and heavier	5.80c.
Galvanized sheets, No. 24, 100 bds. or more	\$4.70
Cold-rolled rounds, hexagons, squares and flats, 1000 lb. and more	\$4.50

On plates, shapes, bars, hot-rolled
strip and heavy hot-rolled sheets the
base applies on orders 400 to 3999 lb.

All prices are f.o.b. consumers'
plants.

For second zone add 10c. per 100 lb.
for trucking.

CHATTANOOGA

Base per Lb.

Mild steel bars	3.96c.
Iron bars	3.96c.
Reinforcing bars	3.96c.
Structural shapes	4.01c.
Plates	4.01c.
Hot-rolled sheets No. 10	3.91c.
Hot-rolled annealed sheets, No. 24*	4.06c.
Galvanized sheets No. 24*.....	4.76c.
Steel bands	4.16c.
Cold-finished bars	4.86c.

* Plus mill item extra.

MEMPHIS

Base per Lb.

Mild steel bars	4.31c.
Shapes, bar size	4.31c.
Iron bars	4.31c.
Structural shapes	4.21c.
Plates	4.21c.
Hot-rolled sheets, No. 10	4.26c.
Hot-rolled annealed sheets, No. 24	4.91c.
Galvanized sheets, No. 24.....	5.66c.
Steel bands	4.56c.
Cold-drawn rounds	4.30c.
Cold-drawn flats, squares, hexagons	6.80c.
Structural rivets	4.35c.
Bolts and nuts, per cent off list	55
Small rivets, per cent off list	60

NEW ORLEANS

Base per Lb.

Mild steel bars	4.20c.
Reinforcing bars	3.24c.
Structural shapes	4.10c.
Plates	4.10c.
Hot-rolled sheets, No. 10.....	4.35c.
Steel bands	4.75c.
Cold-finished steel bars	5.10c.
Structural rivets	4.85c.
Boiler rivets	4.85c.
Common wire nails, base per keg	\$3.30
Bolts and nuts, per cent off list	60

PACIFIC COAST

Base per Lb.

	San Fran- cisco	Los Angeles	Seattle
Plates, tank and U. M.	4.05c.	4.30c.	4.25c.
Shapes, standard	4.05c.	4.30c.	4.25c.
Soft steel bars..	4.20c.	4.30c.	4.45c.
Reinforcing bars, f.o.b. cars dock Pacific ports..	2.975c.	2.975c.	3.625c.
Hot-rolled an- nealed sheets (No. 24)	5.15c.	5.06c.	5.35c.
Hot-rolled sheets (No. 10)	4.30c.	4.50c.	4.50c.
Galv. sheets (No. 24 and lighter)	5.35c.	5.55c.	5.90c.
Galv. sheets (No. 22 and heavier)	6.10c.	5.70c.	5.90c.
Cold-finished steel Rounds	6.80c.	6.85c.	7.10c.
Squares and hexagons..	8.05c.	8.10c.	7.10c.
Flats	3.55c.	3.60c.	3.10c.
Common wire nails—base per keg less carload	\$3.65	\$3.60	\$3.70

All items subject to differentials for
quantity.

REFRACTORIES PRICES

Fire Clay Brick

Per 1000 f.o.b. Works

First quality, Pennsylvania, Maryland, Kentucky, Missouri and Illinois	\$54.00
First quality, New Jersey	56.00
Select, Ohio	49.00
Second quality, Pennsylvania, Maryland, Kentucky, Missouri and Illinois	49.00
Second quality, New Jersey....	51.00
No. 1, Ohio	46.00
Ground fire clay, per ton.....	8.00
5 per cent trade discount on fire clay brick, except for New Jersey, quoted at net price.	

Silica Brick

Per 1000 f.o.b. Works

Pennsylvania	\$54.00
Chicago District	63.00
Birmingham	54.00
Silica cement per net ton (East- ern)	9.50
5 per cent trade discount on silica brick.	

Chrome Brick

Per Net Ton

Standard f.o.b. Baltimore, Plym- outh Meeting and Chester...	\$49.00
Chemically bonded f.o.b. Balti- more, Plymouth Meeting and Chester, Pa.	49.00

Magnesite Brick

Per Net Ton

Standard f.o.b. Baltimore and Chester, Pa.	\$69.00
Chemically bonded, f.o.b. Balti- more	59.00

Grain Magnesite

Per Net Ton

Imported, f.o.b. Baltimore and Chester, Pa. (in sacks).....	\$45.00
Domestic, f.o.b. Baltimore and Chester, in sacks	43.00
Domestic, f.o.b. Chewelah, Wash.	25.00

PIG IRON

No. 2 Foundry

F.o.b. Everett, Mass.	\$25.75
F.o.b. Bethlehem, Birdsboro and Swedeland, Pa., and Sparrows Point, Md.	25.00
Delivered Brooklyn	27.27
Delivered Newark or Jersey City	26.39
Delivered Philadelphia	25.76
F.o.b. Neville Island, Sharpsville and Erie, Pa.; Buffalo, Youngstown, Cleveland, Toledo and Hamilton, Ohio; Detroit; Chicago and Granite City, Ill.	24.00
F.o.b. Jackson, Ohio	25.75
Delivered Cincinnati	24.07
F.o.b. Duluth	24.50
F.o.b. Provo, Utah	22.00
Delivered San Francisco, Los Angeles or Seattle	25.00
F.o.b. Birmingham*	20.38

* Delivered prices on southern iron for shipment to northern points are 38c. a ton below delivered prices from nearest northern basing point on iron with phosphorus content of 70 and over.

Malleable

Base prices on malleable iron are 50c. a ton above No. 2 foundry quotations at Everett, Eastern Pennsylvania furnaces, Erie and Buffalo. Elsewhere they are the same.

Basic

F.o.b. Everett, Mass.	\$25.75
F.o.b. Bethlehem, Birdsboro and Swedeland and Steelton, Pa., and Sparrows Point, Md.	24.50
F.o.b. Buffalo	23.00
F.o.b. Neville Island, Sharpsville and Erie, Pa.; Youngstown, Cleveland, Toledo and Hamilton, Ohio; Detroit; Chicago and Granite City, Ill.	23.50
Delivered Cincinnati	24.51
Delivered Canton, Ohio	24.76
Delivered Mansfield, Ohio	25.26
F.o.b. Jackson, Ohio	25.50
F.o.b. Birmingham	19.00

Bessemer

F.o.b. Everett, Mass.	\$26.75
F.o.b. Bethlehem, Birdsboro and Swedeland, Pa.	26.00
Delivered Boston Switching District	26.50
Delivered Newark or Jersey City	27.39
Delivered Philadelphia	26.76
F.o.b. Buffalo and Erie, Pa., and Duluth	25.00
F.o.b. Neville Island and Sharpsville, Pa.; Youngstown, Cleveland, Toledo and Hamilton, Ohio; Detroit; Chicago	24.50
F.o.b. Birmingham	25.50
Delivered Cincinnati	25.51
Delivered Canton, Ohio	25.76
Delivered Mansfield, Ohio	26.26

Low Phosphorus

Basing points: Birdsboro, Pa., Steelton, Pa., and Standish, N. Y.	\$28.50
---	---------

Gray Forge

Valley or Pittsburgh furnace	\$23.50
------------------------------	---------

Charcoal

Lake Superior furnace	\$27.00
Delivered Chicago	30.04

Canadian Pig Iron

Per Gross Ton

Delivered Toronto	
No. 1 fdy., sil. 2.25 to 2.75	\$26.50
No. 2 fdy., sil. 1.75 to 2.25	25.50
Malleable	26.00
Basic	25.50
Delivered Montreal	
No. 1 fdy., sil. 2.25 to 2.75	\$27.50
No. 2 fdy., sil. 1.75 to 2.25	27.00
Malleable	27.50
Basic	27.00

FERROALLOYS

Ferromanganese

F.o.b. New York, Philadelphia, Baltimore, Mobile or New Orleans	
Domestic, 80% (carload)	\$102.50

RAW MATERIALS PRICES

Spiegeleisen

Per Gross Ton Furnace	
Domestic, 19 to 21%	\$33.00
F.o.b. New Orleans	33.00

Electric Ferrosilicon

Per Gross Ton Delivered	
50% (carloads)	\$69.50
50% (ton lots)	77.00
75% (carloads)	126.00
75% (ton lots)	136.00

Silvery Iron

Per Gross Ton	
F.o.b. Jackson, Ohio, 5.00 to 5.50%	\$27.50

For each additional 0.5% silicon up to 17%, 50c. a ton is added.
The lower all-rail delivered price from Jackson or Buffalo is quoted with freight allowed. Base prices at Buffalo are \$1.25 a ton higher than at Jackson.
Manganese, each unit over 2%, \$1 a ton additional. Phosphorus 0.75% or over, \$1 a ton additional.

Bessemer Ferrosilicon

F.o.b. Jackson, Ohio, Furnace	
Per Gross Ton	
10.00 to 10.50%	\$33.50
10.51 to 11.00%	34.00
11.01 to 11.50%	34.50
11.51 to 12.00%	35.00
12.01 to 12.50%	35.50
12.51 to 13.00%	36.00
13.01 to 13.50%	36.50
13.51 to 14.00%	37.00
14.01 to 14.50%	37.50
14.51 to 15.00%	38.00
15.01 to 15.50%	38.50
15.51 to 16.00%	39.00
16.01 to 16.50%	39.50
16.51 to 17.00%	40.00

Manganese 2 to 3%, \$1 a ton additional. For each unit of manganese over 3%, \$1 a ton additional. Phosphorus 0.75% or over, \$1 a ton additional.
Base prices at Buffalo are \$1.25 a ton higher than at Jackson.

Other Ferroalloys

Ferrotungsten, per lb. contained W del., carloads	\$1.70
Ferrotungsten, lots of 5000 lb.	\$1.75
Ferrotungsten, smaller lots	\$1.80
Ferrochromium, 4 to 6% carbon and up, 65 to 70% Cr per lb. contained Cr delivered, in carloads, and contract	10.50c.*
Ferrochromium, 2% carbon	16.50c. to 17.00c.*
Ferrochromium, 1% carbon	17.50c. to 18.00c.*
Ferrochromium, 0.10% carbon	19.50c. to 20.00c.*
Ferrochromium, 0.06% carbon	20.00c. to 20.50c.*
Ferrovanadium, del. per lb. contained V.	\$2.70 to \$2.90
Ferrocolumbium, per lb. contained columbium, f.o.b. Niagara Falls, N. Y.	\$2.50*
Ferrocobalt, 15 to 18% Ti, 7 to 8% C, f.o.b. furnace carload and contract per net ton	\$142.50
Ferrocobalt, 17 to 20% Ti, 3 to 5% C, f.o.b. furnace, carload and contract, per net ton	\$157.50
Ferrophosphorus, electric, or blast furnace material, in carloads, f.o.b. Anniston, Ala., for 18%, with \$3 unitage, freight equalized with Rockdale, Tenn., per gross ton	63.50
Ferrophosphorus, electric, 24%, in carlots, f.o.b. Anniston, Ala., per gross ton with \$3 unitage, freight equalized with Nashville, Tenn.	80.00
Ferromolybdenum, per lb. Mo del.	95c.
Calcium molybdate, per lb. Mo del.	80c.
Silico spiegel, per ton, f.o.b. furnace, carloads	\$45.00
Ton lots or less, per ton	50.00
Silico-manganese, gross ton, delivered.	
3%	101.50
2.50% carbon grade	106.50
2% carbon grade	111.50
1% carbon grade	121.50

* Spot prices are \$5 a ton higher. Spot premium on 75 per cent ferrosilicon is \$10 a ton.

ORES

Lake Superior Ores

Delivered Lower Lake Ports	
Per Gross Ton	
Old range, Bessemer, 51.50%	\$5.25
Old range, non-Bessemer, 51.50%	5.10
Mesabi, Bessemer, 51.50%	5.10

Mesabi, non-Bessemer, 51.50%	\$4.95
High phosphorus, 51.50%	4.85

Foreign Ore

C.A.F. Philadelphia or Baltimore

Per Unit	
Iron, low phos., copper free, 55 to 58% dry, Algeria, nominal	17.00c.
Iron, low phos., Swedish, average, 68 1/4% iron	Nominal
Iron, basic or foundry, Swedish, aver. 65% iron	Nominal
Iron, basic or foundry, Russian, aver. 65% iron	Nominal
Man., Caucasian, washed 52%	47c.
Man., African, Indian, 44-48%	Nominal
Man., African, Indian, 49-51%	Nominal
Man., Brazilian, 46 to 48 1/4%	Nominal

Per Net Ton Unit

Tungsten, Chinese, wolframite, duty paid delivered nominal	\$23.50 to \$25.50
Tungsten, domestic, scheelite delivered	Nominal
Chrome ore (lump) c.i.f. Atlantic Seaboard, per gross ton: South African (low grade)	\$16.00
Rhodesian, 45%	23.00
Rhodesian, 48%	26.50
Turkish, 48-49%	25.50 to \$26.50
Turkish, 45-46%	23.50 to 24.00
Turkish, 44%	19.00 to 19.50
Chrome concentrates (Turkish) c.i.f. Atlantic Seaboard, per gross ton: 50%	\$24.50 to \$25.00
48-49%	25.50 to 26.50

FLUORSPAR

Per Net Ton

Domestic, washed gravel, 85-5, f.o.b. Kentucky and Illinois mines, all rail	\$20.00
Domestic, barge and rail	19.50 to 21.50
No. 2 lump, 85-5, f.o.b. Kentucky and Illinois mines	21.00
Foreign, 85% calcium fluoride, not over 5% silicon, c.i.f. Atlantic ports, duty paid	24.50
Domestic No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2 1/4% silicon, f.o.b. Illinois and Kentucky mines	35.00

FUEL OIL

Per Gal.

F.o.b. Bayonne or Baltimore, No. 3 distillate	5.25c.
F.o.b. Bayonne or Baltimore, No. 4 industrial	5.25c.
Del'd Ch'go, No. 3 industrial	4.15c.
Del'd Ch'go, No. 5 industrial	4.00c.
Del'd Cleve'd, No. 3 distillate	5.75c.
Del'd Cleve'd No. 4 industrial	5.75c.
Del'd Cleve'd No. 5 industrial	5.00c.

COKE AND COAL

Per Net Ton

Furnace, f.o.b. Connells-ville, Prompt	\$4.35 to \$4.60
Foundry, f.o.b. Connells-ville, Prompt	5.00 to 6.25
Foundry, by-product, Chicago ovens	10.25
Foundry, by-product, del'd New England	12.50
Foundry, by-product, del'd Newark or Jersey City	10.85 to 11.30
Foundry, by-product, Philadelphia	10.60
Foundry, by-product, delivered Cleveland	11.00
Foundry, by-product, delivered Cincinnati	10.50
Foundry, Birmingham del'd St. Louis industrial district	11.00 to 11.50
Foundry, from Birmingham, f.o.b. cars docks, Pacific ports	14.75
Coal	
Per Net Ton	
Mine run steam coal, f.o.b. W. Pa. mines	\$1.50 to \$1.75
Mine run coking coal, f.o.b. W. Pa.	1.75 to 1.90
Gas coal, 1/4-in. f.o.b. Pa. mines	2.00 to 2.25
Mine run gas coal, f.o.b. Pa. mines	1.80 to 2.00
Steam slack, f.o.b. W. Pa. mines	1.00 to 1.25
Gas slack, f.o.b. W. Pa. mines	1.20 to 1.45



For
High Quality
STEELS

NIAGARA

BRAND

FERRO-ALLOYS

FERRO SILICON
ALL GRADES

FERRO CHROMIUM
HIGH CARBON

FERRO CHROMIUM
LOW CARBON

FERRO MANGANESE
SILICO MANGANESE

PITTSBURGH METALLURGICAL CO., Inc.

NIAGARA FALLS, N.Y.

Sales Offices: NEW YORK—30 Church St. • PITTSBURGH—Oliver Bldg. • CLEVELAND—Hanna Bldg.



THIS WEEK'S MACHINE ... TOOL ACTIVITIES ...

... Buying and inquiries well sustained as strike news clarifies.

o o o

... Tractor builders are engaged in programs.

o o o

... June and early part of July see further price increases ranging up to 10 per cent.

Chicago

INQUIRIES, which for the past several weeks have been for small lots of tools, usually only one or two each, have abruptly reversed their course in the past seven days and are now being received for lists from a variety of manufacturers. One explanation of this diversion of business from small to large lots is that the apparent weakening of the CIO movement is causing a renewal of confidence, and larger buyers are re-entering the market. Consumption by the agricultural implement industry has been good, particularly from the International Harvester Co. tractor works here. The Crane Co., and the J. I. Case Co. are said to be contemplating new buying programs. Allis-Chalmers is reported to have some plans out for a new tractor motor, definite information about which is not available. The resumption of buying upon the easing of the labor situation is expected by at least one seller to attain such proportions that some of the announced vacation schedules may be postponed, so great will be the rush of new business.

Cleveland

MACHINERY sales picked up moderately here last week on the strength of one or two quietly executed purchases. Complete tool room equipment, involving 15 to 20 machines, was bought by General Electric Co. for its Trumbull Lamp Works division at Warren, Ohio, and orders were likewise placed here for a lot of 10 to 12 units by the Aluminum Co. of America. These machines will be shipped across the continent to equip a West Coast plant of the latter. The Chesapeake & Ohio railroad is expected to close shortly for 10 to 15 machines, including grinders, shapers and lathes, on which it has already been quoted. No other attractive lots are pending at the moment, though new business continues to turn up

spasmodically. Machine tool manufacturers have as yet made no appreciable dent in order backlogs, and deliveries remain well extended. Makers of horizontal boring mills, whose limited capacity has been heavily taxed by the recent buying wave, are generally unable to quote additional business for shipment before late January, to cite a specific case. Some manufacturers of this type of equipment have increased prices about 10 per cent, effective since July 1. Increases have been announced, effective July 1, or July 15, by certain manufacturers of riveting equipment, precision lathes and milling machines, these advances ranging between 7 and 10 per cent. One manufacturer of surface grinders has advanced the price of his product by about 5 per cent since the close of June, and on June 1 an important forging machine manufacturer raised prices approximately 10 per cent.

Cincinnati

THE local machinery market tends easier than during the spring months. Ordering is slower, but steady. Some shift in source is noted as business tends lighter from areas affected by labor disturbances, but is unabated in other districts. Foreign demand is reported to be good and business is from both European and Asiatic users. Current ordering the past week was about on a parity with the preceding week, allowing for the holiday period. Inquiry is steadily active and reflects an unabated interest in tools. A smattering of automobile orders is reported, but the extent of this business is not impressive. Milling and grinding machinery are most active in the present market.

Production is holding to the level of the last four months since manufacturers desire reduction of present backlogs. Shipments are closer to consumer requirements although improvement is currently sought. Labor conditions are quiet.

Pittsburgh

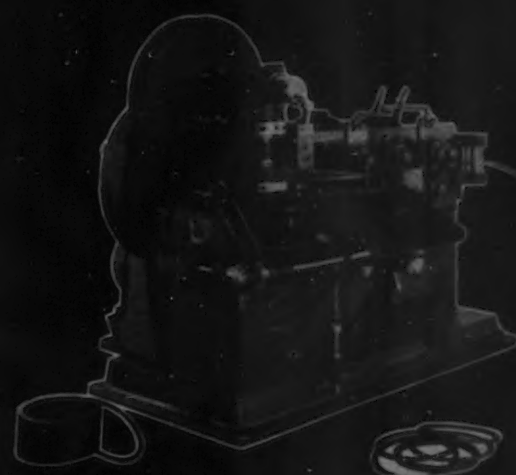
INQUIRIES continue strong and if anything are in slightly better volume than a week ago. Total orders show little change from recent levels and, in view of the season, they are considered satisfactory. Although the amount of business being placed is not as large as the records made several months ago, it has the characteristics of a normal volume which represents actual and immediate needs. With delivery becoming further extended, orders reaching manufacturers in the aggregate are ahead of shipments. As yet no general price increases have been announced but a few manufacturers within the past three weeks have put through adjustments averaging 10 per cent. In most cases these adjustments apply on equipment, deliveries for which are extended several months. Some manufacturers, as noted in previous reports, are not quoting prices on some machine tools which are booked ahead for several months. Meanwhile, steel mill equipment manufacturers continue exceptionally busy and recent business placed, both for domestic and foreign interests, precludes any downward trend for quite some time. Inquiries for machine tools for the Pittsburgh-Corning Corp. building at Port Allegany, Pa., have not made their appearance as yet. The plant will manufacture glass bricks.

New York

FROM all reports July will turn out to be a quiet month in machine tool business, as gaged by the orders booked last week. With one exception, dealers reported a falling off in inquiries, but the volume of quotations is still far from low. Some improvement is noted in delivery promises, as orders begin to fall below shipments. Occasionally one hears of rapid revisions in schedules wherein a machine promised for September was shipped the last of June, but the explanation lies in the sidetracking of some other unit for lack of parts supplied on the outside. Bearing deliveries are slow, and there have been labor difficulties in foundries. Machines made of rolled steel have also felt the uncertainties occasioned by strike difficulties in steel mills and the previously existing condition of long deliveries on plates. Six months is pretty much average on many machines, so that the promise of six weeks delivery on certain sizes of radial drills mentioned by one vendor, is news. At best improvement in deliveries is spotty.

The continued price rise seems to have reached a temporary halt. Some price announcements were made in late May, and other announcements became effective June 15 and July 1. The feeling is that prices have leveled off and that most increased labor costs have been discounted. A hidden cost not revealed in wage rates is the more independent and leisurely attitude assumed by the workers, who set their own pace regardless of the desires of management.

EDENCO



Over 80 Sizes and Types of
Angle Bending Rolls
Wrapping Type Benders
Plate Benders
Coil Bending Rolls
Special Benders

To Meet Your Needs

KANE & ROACH

Syracuse, N. Y.



PLANT EXPANSION AND EQUIPMENT BUYING

◀ NORTH ATLANTIC ▶

Linde Air Products Co., 30 East Forty-second Street, New York, has let general contract to E. W. Sproul Construction Co., 2001 West Pershing Road, Chicago, for new two-story plant at Chicago, about 120,000 sq. ft. floor space. Cost close to \$175,000 with equipment. E. Stenbeck, 332 South La Salle Street, Chicago, is architect.

Union Confectionery Machinery Corp., 318 Lafayette Street, New York, has leased 10-story building at John and Jay Streets, Brooklyn, totaling about 100,000 sq. ft. floor space, for new storage and distributing plant, with machine department.

Calvert Distillers Corp., 405 Lexington Avenue, New York, has begun expansion and improvements at plant at Relay, Md., including new one-story unit for rectifying department, two six-story structures for storage and distribution, extensions in mechanical bottling division, and other expansion. Cost close to \$450,000 with equipment.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until July 13 for one motor-driven crankshaft grinder (Schedule 1154) for Philadelphia Navy Yard.

Scott Paper Co., Chester, Pa., will take bids soon on general contract for one and multi-story mill additions. Cost close to \$1,000,000 with equipment. Stone & Webster Engineering Corp., Boston, is architect and engineer.

Commanding Officer, Ordnance Department, Frankford Arsenal, Philadelphia, asks bids until July 22 for five milling machines (Circular 912); until July 28, three milling machines, special bench type (Circular 911), files, metal-cutting saws, abrasive stones, etc., 271 items in all (Circular 908).

Adam Scheidt Brewing Co., Norristown, Pa., has let general contract to Henry E. Batson, Inc., 1713 Sansom Street, Philadelphia, for nine-story brewhouse, 60 x 112 ft. Cost close to \$125,000 with equipment. E. Lane Crawford, Norristown, is architect; H. P. Friend, Norristown, and Harold S. Ellington, Stroh Building, Detroit, are engineers.

◀ NEW ENGLAND ▶

Miller Co., Center Street, Meriden, Conn., manufacturer of electric lighting fixtures, lamps, etc., has asked bids on general contract for one-story addition, 60 x 125 ft. Cost over \$50,000 with equipment. Leo F. Caproni, 1221 Chapel Street, New Haven, Conn., is architect and engineer.

Westinghouse Electric & Mfg. Co., Springfield, Mass., has let general contract to T. A. Pearson Associates, Inc., 25 Harrison Avenue, for one-story foundry, 160 x 270 ft. Cost about \$100,000 with equipment.

Crocker, Burbank & Co. Association, Westminster Street, Fitchburg, Mass., manufacturer of coated and other paper stocks, has let general contract to W. J. Handley Co., 47 Nocke Street, for two-story addition, 100 x 240 ft., primarily for storage and distribution. Cost over \$60,000 with equipment.

◀ OHIO AND INDIANA ▶

General Spring Co., 125 East McMicken Street, Cincinnati, coiled wire springs and other steel springs, has asked bids on general contract for one-story plant unit, 85 x 165 ft., at Evanston. Cost over \$70,000 with equipment. Carlton, Frankenberger & Batson, 4122 Davis Lane, are architects and engineers.

Industrial Rayon Corp., Cleveland, has let general contract to Hunkin-Conkey

Construction Co., local, for new viscose rayon mill at Painesville, Ohio, consisting of main mill, 600 x 670 ft., and smaller units, with power house, water-treatment plant and machine shop. Cost about \$7,000,000. Wilbur Watson & Associates, 4614 Prospect Avenue, are architects and engineers.

Gulf Refining Co., 2935 Front Street, Toledo, has asked bids on general contract for new hangar, 110 x 200 ft., with reconditioning and repair facilities, at Brookpark Airport, Cleveland. Cost close to \$175,000 with equipment.

Contracting Officer, Material Division, Army Air Corps, Wright Field, Dayton, Ohio, asks bids until July 12 for one thrust meter (Circular 865); until July 19, altimeter assemblies in lots of 1000 to 2000 (Circular 856); until July 21, suction gage assemblies in lots of 600 to 1100 (Circular 862); until July 26, tachometer assemblies in lots of 700 to 1200, generator assemblies in lots of 500 to 1000, and indicator assemblies in lots of 500 to 1000 (Circular 866).

◀ MICHIGAN DISTRICT ▶

Saginaw Malleable Iron Division, General Motors Corp., Saginaw, Mich., has let general contract to Austin Co., Cleveland, for one-story addition, 100 x 520 ft. Cost over \$175,000 with equipment.

American Forging & Socket Co., Pontiac, Mich., has plans for one-story addition, 170 x 275 ft. Cost over \$90,000 with equipment. L. J. Heenan, Peoples State Bank Building, is architect.

Chase Brass & Copper Co., Inc., 2798 East Grand Boulevard, Detroit, has let general contract to J. A. Utley, 6031 Mansur Street, for one-story factory branch, storage and distributing plant. Cost over \$50,000 with equipment. Smith, Hinchman & Grylls, Marquette Building, are architects and engineers.

◀ SOUTH CENTRAL ▶

United States Engineer Office, Vicksburg, Miss., asks bids until July 15 for one diesel engine-generator set with auxiliary equipment (Circular 322).

Board of Harbor Commissioners, Alabama State Docks, Mobile, Ala., plans installation of conveying and elevating machinery, loaders and other mechanical-handling equipment in connection with expansion at State docks, including new wharves and other facilities. Fund of \$1,550,000 has been secured through Federal aid.

Water Department, Danville, Ky., will take bids soon for 150,000-gal. steel water tank and tower for municipal waterworks. Robert C. Terrell, City Building, is city engineer.

United States Engineer Office, Memphis, Tenn., asks bids until July 16 for six 32-in. cast steel ball joints (Circular 315).

◀ WASHINGTON DIST. ▶

Chemical Warfare Service, Edgewood Arsenal, Edgewood, Md., asks bids until July 19 for seven rotary machines, including four sets of rolls, 130 can-opening machines and 260 extra sets of cutters for can-opening machines (Circular 209); until July 29, 13,000 to 18,500 cadmium-coated wire springs (Circular 214).

Northern Neck Electric Co-operative Association, Warsaw, Va., plans steam-electric generating plant for new rural electrification system in parts of Lancaster, Northumberland and neighboring counties, totaling 140 miles. Fund of \$184,000 has been secured through Federal aid for project.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until

July 13 for cone joint fittings (Schedule 1147) for Portsmouth and Mare Island yards; 50,000 lb. of steel wool (Schedule 1093) galvanized iron or steel wire rope clips (Schedule 1159); until July 16, composition valves (Schedule 1165); until July 20, chain (Schedule 1160), wire cloth (Schedule 1152), one 7500-gal. steel tank for underground gasoline storage, and three 10,000-gal. similar tanks (Schedule 1174) for Eastern and Western yards.

◀ SOUTHWEST ▶

Sheffield Steel Corp., Sheffield Station, Kansas City, Mo., has plans for mill additions, including one-story light forging shop, one-story semi-finished storage and distributing building, three one-story wire mills, two one-story storage and distributing buildings, two-story service building and other structures. Cost over \$1,500,000 with equipment.

Tulsa Portland Cement Co., 1537 East Admiral Place, Tulsa, Okla., is considering new mill near city, with power house and machine shop. Cost close to \$100,000 with equipment.

Shaffer Tool Works, Inc., Brea, Cal., manufacturer of oil well tools and equipment, has let general contract to Samuel D. Cook, 3769 Farber Street, Houston, Tex., for new one-story plant, 150 x 370 ft., at Navigation and Greenwood Streets, Houston. Cost over \$60,000 with equipment. Company will remove to new location and increase capacity.

Engelman Gardens Association, Edinburg, Tex., fruit packer, has approved plans for one-story plant near city, with dehydrating department and storage and distributing facilities. Cost close to \$90,000 with equipment.

◀ MIDDLE WEST ▶

Forgings & Stampings, Inc., 1025 Twenty-third Avenue, Rockford, Ill., has let general contract to Linden & Sons, Inc., 1102 Tenth Street, for one-story addition, 28 x 130 ft. Cost over \$60,000 with equipment.

Binks Mfg. Co., 3124 West Carroll Street, Chicago, manufacturer of spraying equipment and devices, spray booths, etc., has plans for two-story addition. Cost about \$70,000 with equipment. Austin Co. is architect and engineer.

Commanding Officer, Ordnance Department, Rock Island Arsenal, Rock Island, Ill., asks bids until July 13 for milling cutters (Circular 809), parts for tramrail system, including tramrail, rail curve, rail clamps, rail couplings, conductor bar supports, conductor bar couplings, etc. (Circular 810).

Colorado Fuel & Iron Co., Continental Oil Building, Denver, has let general contract to Mead & Mount Construction Co., Denver National Bank Building, for one-story building, 100 x 125 ft., for storage and distribution. Cost over \$50,000 with equipment.

Jacob Schmidt Brewing Co., 882 West Seventh Street, St. Paul, Minn., has let general contract to Walter W. Magee Co., 118 West Central Avenue, for one-story addition, 126 x 135 ft. Cost close to \$50,000 with equipment.

◀ PACIFIC COAST ▶

Hotpoint Electric Heating Co., Division of Edison General Electric Appliance Co., Ontario, Cal., has let general contract to Stratton Construction Co., San Gabriel, Cal., for one-story addition. Cost about \$35,000 with equipment. Claud Beelman, Union Bank Building, Los Angeles, is architect.

Eastside Winery, Lodi, Cal., has let general contract to George Wallace, Escalon, Cal., for one-story addition, 38 x 115 ft. Cost about \$40,000 with equipment. E. G. Ernst, Stockton, Cal., is architect.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until July 16 for parts for airplanes (Schedules 900-964 and 900-971) for Naval Air Station, San Diego, Cal.; composition valves, with union nut and pipe sleeve (Schedule 1144) for Puget Sound yard.

Washington Distillery Co., Selah, Wash., has let general contract to Lee Sigles, Yakima, Wash., for one-story distillery, 60 x 150 ft. Cost about \$40,000 with equipment. Walter H. Rothe, Liberty Building, Yakima, is architect.

New Industrial Literature

A REVIEW OF CURRENT CATALOGS AND CIRCULARS . A TIME SAVING SERVICE FOR BUYERS

Order by number literature wanted. No cost. No obligation
Address The Iron Age, 239 West 39th St., New York City

BOLTS AND NUTS.—Bethlehem Steel Co. 75-page handbook containing general information on wrench-head bolt and nut standards, cut threads and rolled threads, form of threads, thread fits, and finish. Also gives weights, dimensions, and list prices. Bulletin 7-194.

DIESEL TRACTORS.—Caterpillar Tractor Co. 7-page booklet replete with illustrations of actual uses to which Caterpillar tractors are put in various lands. Bulletin 7-195.

SCREENS.—Robins Conveying Belt Co. Bulletin describing "Eplitex" screens. Screen motion follows an elliptical orbit, and can be used for screening coal, coke, ore, stone, and other material. Bulletin 7-196.

V-BELTS.—Gates Rubber Co. A monthly publication, "Industrial News", which describes the various features of Gates' v-belts and illustrates many typical applications. Bulletin 7-197.

PIPE CUTTING AND THREADING MACHINE.—Curtis & Curtis Co. Leaflet containing descriptive material on belt, hand, and electrically driven machines for sizes up to 16-in. Bulletin 7-198.

MERCURY LAMP TRANSFORMERS.—Jefferson Electric Co. 8-page catalog describing and illustrating transformers for mercury vapor lamps. Includes specifications for all indoor and weather-proof models. Bulletin 7-199.

FOUNDRY EQUIPMENT.—Whiting Corp. 3 new bulletins covering traveling cranes, tumbling mills, and cupolo ladles. Also illustrates preheating apparatus in use with cupola and Brackelsberg furnace. Bulletin 7-200.

CONVEYORS.—Portable Machinery Co., Division of A. B. Farquhar Co., Ltd. Folder depicting various applications of "Porta", freight type, conveyors handling bags, boxes, kegs, rolls, etc. Bulletin 7-201.

TEMPERING FURNACES.—Lindberg Engineering Co. A series of bulletins describing "Cyclone" box type and screw type furnaces, designed for use with either

gas or electricity. Also describes various controls used in connection with these furnaces. Bulletin 7-202.

COAL SCREENS.—Allis-Chalmers Mfg. Co. 12-page bulletin devoted to coal screens. Has illustrations of various types and representative installation views. Bulletin 7-203.

ELECTROPLATING RECTIFIERS.—Hanson-Van Winkle-Munning Co. Folder describing construction, installation, and operation of copper oxide plate rectifiers. Another bulletin describes buffs and buffing compositions, giving their characteristics and uses. Bulletin 7-204.

HYDRAULIC PRESSES.—A. B. Farquhar Co., Ltd. Folder in roto-gravure illustrating a number of hydraulic production press installations. Bulletin 7-205.

ROAD MACHINES.—Caterpillar Tractor Co. 38-page catalog describing and illustrating "Caterpillar Auto Patrols". Has many close-ups and cut-away drawings of various section of machines. Machines are gasoline or diesel driven. Bulletin 7-206.

AIR-FILTERS.—Northern Blower Co. Bulletin describes and illustrates "Norblo" round type air filters. Filters are automatic and designed for continuous operation, as in cleaning gases from smelting operations, removing solids from air-swept tube mills, etc. Bulletin 7-207.

DRILL STEEL FORGES.—Monarch Engineering & Mfg. Co. Bulletin describes both portable and non-portable forges, using either oil, gas, coke, coal or charcoal. Gives specification for single and double forge. Bulletin 7-208.

MULTIPLE DISC CLUTCHES.—Rockford Drilling Machine, Div. of Borg-Warner Corp. 20-page booklet describing "Pullmore" multiple disc clutches for operation in oil or dry, in capacities from 1-hp. to 75-hp. at 500 r.p.m. Booklet is illustrated with representative applications and gives dimensions and ratings. Bulletin 7-209.

ROFFING AND SIDING.—Johns-Manville.

A brochure giving pointers on the maintenance of industrial roofs and sidings. Also describes "Transite", a roof and siding material which is incombustible, weather-proof, and highly resistant to corrosion. Another booklet available describes insulating brick, giving its properties and showing various typical installations. Bulletin 7-210.

IMMERSION HEATERS.—Harold E. Trent Co. Leaflet illustrating electric strip immersion heaters for hanging over the side of plating tanks. Bulletin 7-211.

HEAVY DUTY ENGINES.—Wisconsin Motor Corp. Two folders covering the application of "Wisconsin" heavy duty, air cooled engines to driving air compressors, pumps, and various specialized machinery. Bulletin 7-212.

OIL HEATER AND BURNER.—R-S Products Corp. Three bulletins describing Ryan automatic oil burners, "Visco-Control" for heating and mixing fuel oils, and a furnace pressure control for governing the oxidation and decarburization atmospheres in annealing furnaces. Illustrated with many typical applications. Bulletin 7-213.

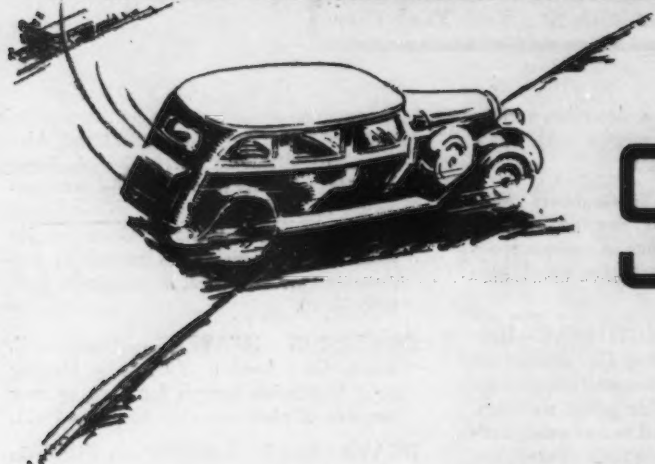
PLAIN GRINDING MACHINES.—Landis Tool Co. Catalog D-37, 22 pages, devoted to 6 and 10-in. type C plain hydraulic grinders, which feature flexibility for mass production applications. Specifications are given, and the large number of illustrations include a variety of actual setups. Bulletin 7-214.

AIR CIRCULATOR.—Motor Service & Mfg. Co. Folder describing and illustrating circulator working on suction and pressure principle. Specifications included. Bulletin 7-215.

AUTOMATIC VALVE CONTROL.—Philadelphia Gear Works. Booklet describing and illustrating "limitorque" control for mechanically actuating all types of valves. May also be applied to damper controls, sprinkler systems, bulkhead doors, and sluice gates. Contains dimensions, wiring diagrams, and engineering data. Bulletin 7-216.

*If you want your new catalog or literature listed here
send a copy to above address*

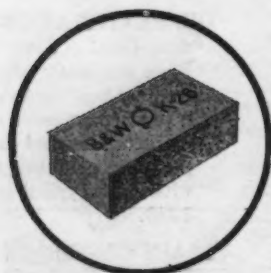
ROADABILITY IN AUTOMOBILES...



STABILITY IN

"BACKING UP"

INSULATION



Processed at temperatures higher than any they will be required to meet in service. Can be used exposed, as furnace lining—hence have a high factor of safety.

"Backing up" insulation without stability is like an automobile that has power, style and comfort—but won't hold the road.

B&W Insulating Firebrick have low heat conductivity, and they also possess the ability to withstand the continuous application of heat without structural change. Without stability, insulating value or any other property is useless. That's why B&W Insulating Firebrick are ideal for "backing up"; they don't crumble or disintegrate, nor shrink, nor pull away from the lining to form lanes that let air enter the furnace or gases escape.

Write for Bulletin R-2-E.

THE BABCOCK & WILCOX COMPANY
85 Liberty Street New York, N. Y.

BABCOCK & WILCOX

R-53

The *has* **14** Continuous Strip Pickler..



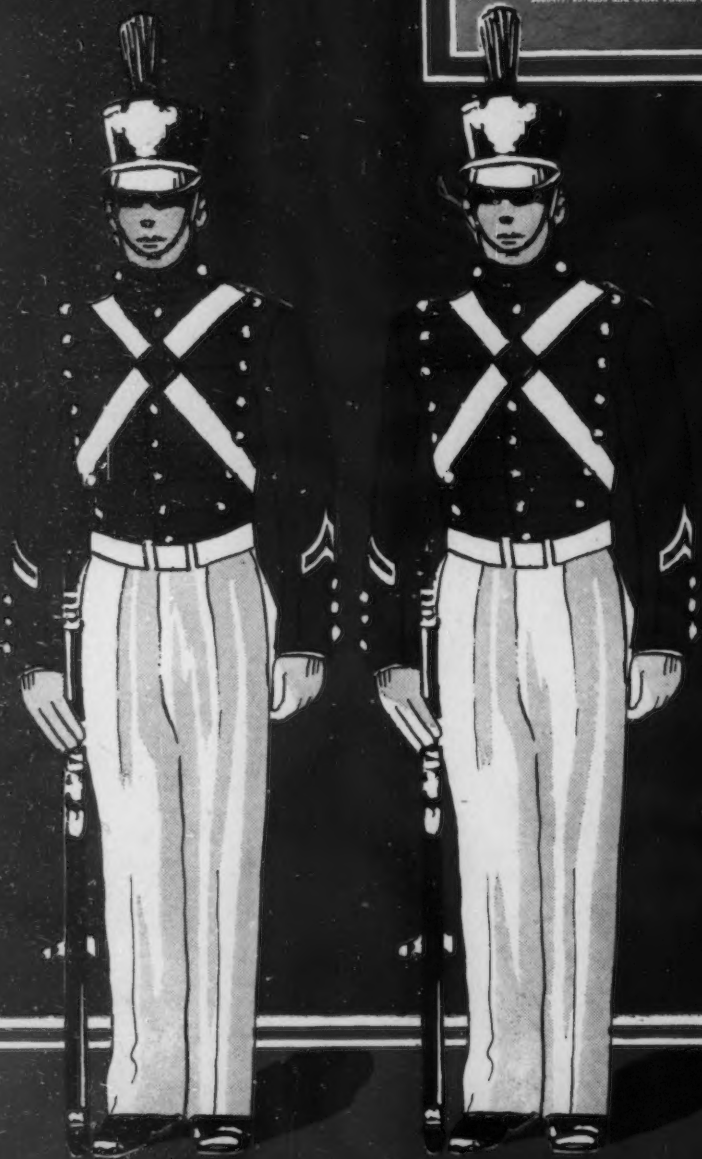
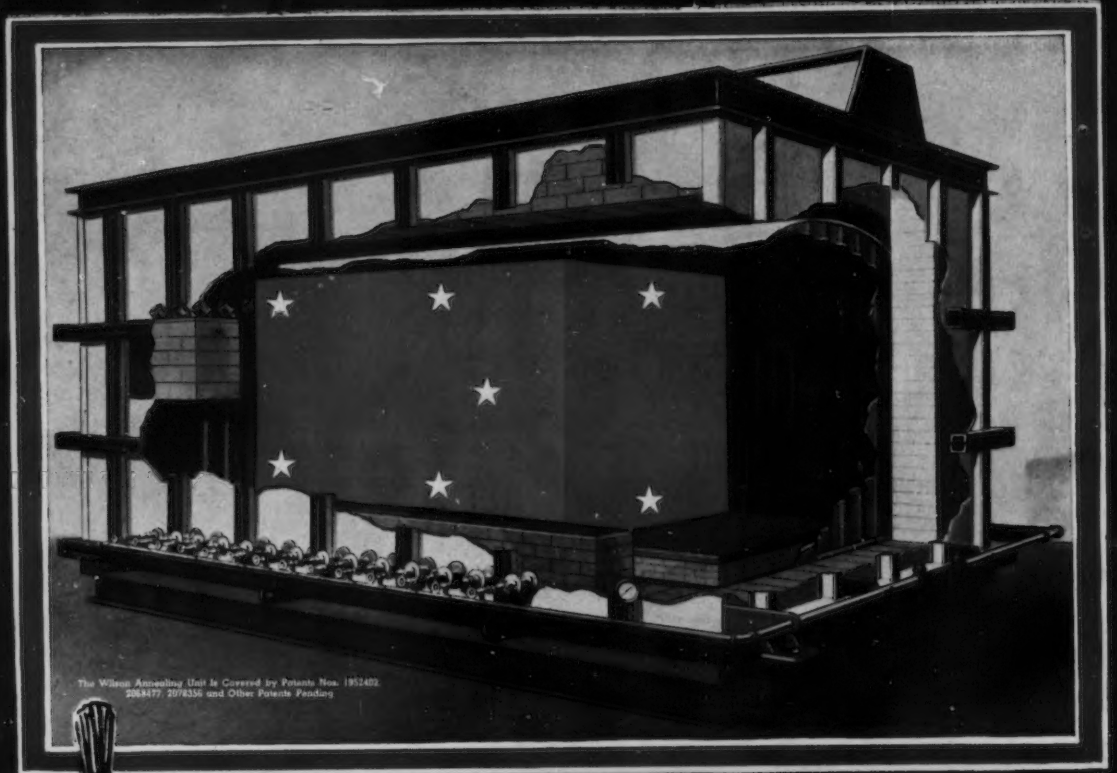
THE WEAN ENGINEERING CO., INC.

WARREN, OHIO

SPECIALISTS IN SHEET, TIN, AND STRIP MILL EQUIPMENT

ASSOCIATE COMPANIES

FLINN & DREFFEIN CO. THE MCKAY MACHINE CO. LEE WILSON ENGINEERING CO.



Sold by THE WEAN ENGINEERING CO., INC.
WARREN, OHIO



**THERE IS A
DIFFERENCE**

You See It
**IN THE QUALITY
OF YOUR WORK**



Cleaner, smoother cuts, whether the job is drilling, threading, reaming or milling! *Important*, in these days of closer tolerances and greater precision in all metal manufacture.

To be sure their work will show these cleaner, smoother cuts, quality-minded, cost-minded production executives and shop men rely on the extra values in Morse Tools. They have proved to themselves "there is a difference."

This difference results from extra value—Morse control of heat treatment—rigid step-by-step inspection—exceptionally accurate grinding. Morse's many years of tool making experience play their part.

If there is any doubt as to a difference in brands of metal-removing tools, prove to yourself "there is a difference" by trying a Morse tool on your next job.

A conveniently located Morse Distributor will give you prompt service

MORSE

**TWIST DRILL & MACHINE COMPANY
NEW BEDFORD . . . MASS., U. S. A.**

**NEW YORK STORE
130 LAFAYETTE ST.**

**CHICAGO STORE
570 WEST RANDOLPH ST.**

THE MORSE LINE INCLUDES HIGH SPEED AND CARBON DRILLS - REAMERS - CUTTERS - TAPS and DIES - SCREW PLATES - ARBORS - CHUCKS - COUNTERBORES - HANDRELS - TAPER PINS - SOCKETS - SLEEVES



TRAINED FIGURES. That's what business wants; figures that give you facts accurately and promptly—a clear picture of your business.

Monroe is far more than a maker and seller of machines. It is a nation-wide figure service, built up through a quarter of a century, that operates through 150 branch offices. Whether you need adding-calculators, adding-listing, bookkeeping machines, or check writing equipment, Monroe has 200 different models, plus the practical experience that can help you adapt the right machine to the special figuring requirements of your business.

Get in touch with us through the nearest Monroe branch, ask to see a "Velvet Touch" Monroe at work on your own figures.

"Give a Thought to Keyboards" is a new booklet in color that tells about Monroe ease of operation, and shows the wide range of Monroe models. Write for a free copy. Monroe Calculating Machine Company, Inc., Orange, N. J.

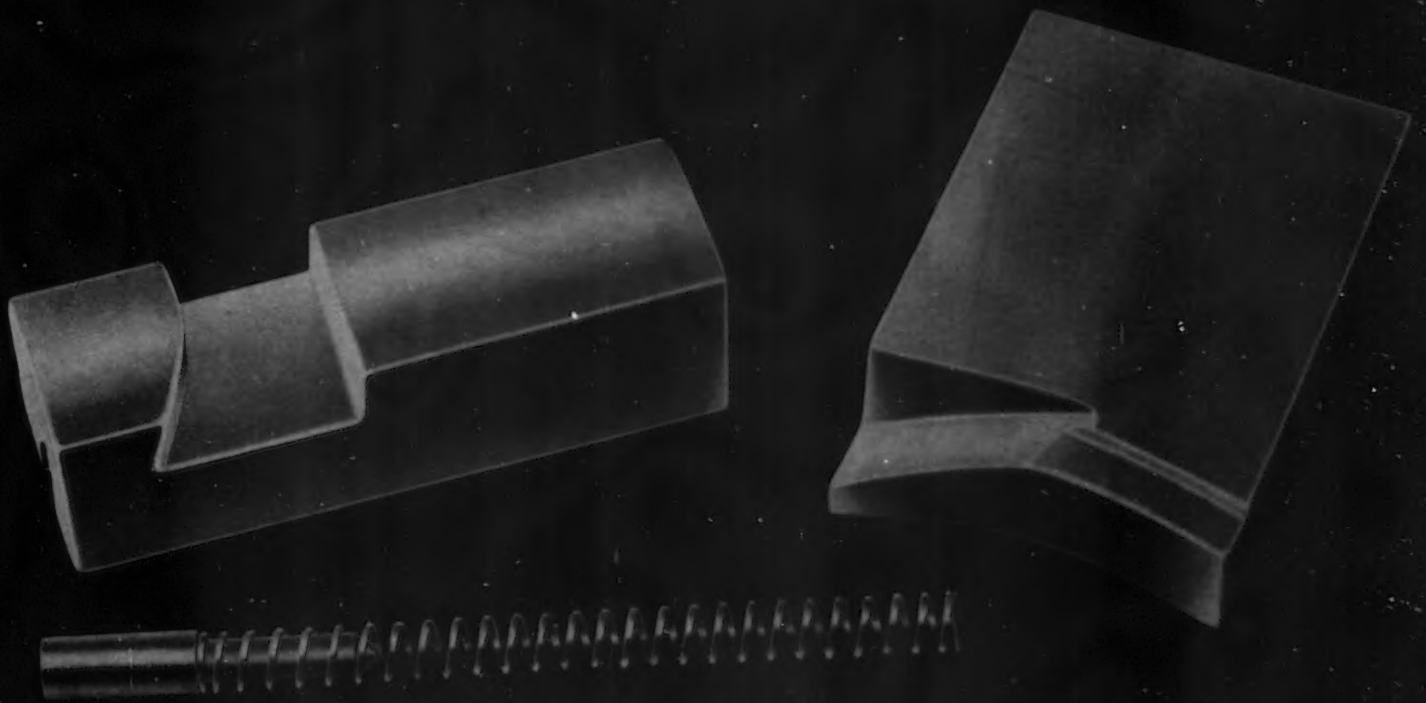
MONROE

ADDING-LISTING
MACHINE
Grand Total Model

One of a wide range of Monroes for adding, accounting, and bookkeeping — all with "Velvet Touch," easy keyboards



THE *Heart* OF



THE V & O PRESS

Special attention is given to the V & O clutch realizing that it is the heart of the machine. During years of research and experience we have determined the proper materials. These materials carefully machined, properly heat treated, and finished to a high degree of accuracy, give wearing qualities which make it a care-free unit. The generated angles make it smooth in action and the built in non-clicking feature eliminates the clicking which is the press users' consternation.



THE V & O PRESS COMPANY, HUDSON, N. Y., U. S. A.

AGENTS

HENRY PRENTISS & CO., NEW YORK, HARTFORD, BOSTON, SYRACUSE, BUFFALO.
MARSHALL & HUSCHART MACHINERY CO., CHICAGO, MILWAUKEE.
STERLING-FRENCH MACHINERY CO., DETROIT.
GEORGE L. LIND, PHILADELPHIA.
WILLIAM K. STAMETS, PITTSBURGH, CLEVELAND.
ARTHUR JACKSON MACHINE TOOL CO., TORONTO, MONTREAL.

ELLIOTT & STEPHENS MACHINERY CO., ST. LOUIS.
TIDEWATER SUPPLY CO., NORFOLK, ROANOKE, VA., COLUMBIA, S. C., ASHE-
VILLE, N. C.
B. S. MAIS MACHINERY CORP., HOUSTON AND DALLAS, TEXAS.
JOSEPH F. FRUM SALES ENGINEERING CO., CINCINNATI, OHIO.
THE NATIONAL MACHINE TOOL & SUPPLY CO., MINNEAPOLIS, MINN.
MEYER MACHINERY CO., LOS ANGELES, CALIFORNIA.

CASE STUDY
NO. 166

HERE'S THE DIE HEAD THAT SPEEDS PRODUCTION, CUTS COSTS

Every shop using this precision-made die head and circular chasers reports remarkable savings. Down-time is reduced. Production increased. Quality of production improved. Scrap loss decreased.

National Acme Circular Chasers are easy to change, easy to adjust, easy to operate. You can produce more threads per grind, many more grinds per chaser. Write for actual case histories.



HERE'S WHY NATIONAL ACME GRIDLEY AUTOMATICS PAY FOR THEMSELVES QUICKLY

- You can make heavy cuts without vibration because of rigid construction of frame and better support of cutting tools.
- Simplicity of design—quick change of set-up saves time.
- Tooling accessible—easily adjusted. Top slides set at an angle, instead of horizontally, provide easy access to tools.
- Ample chip space—can be cleaned while in operation. Tool slide drum placed under gear box section leaving central space clear for chips.
- Wide range of spindle speeds—greater versatility.
- Remarkably fast indexing—a minimum of idle time.
- Anti-friction bearings throughout—cut maintenance costs.
- Forced feed automatic lubrication.
- Smooth-running gears of heat-treated steel.
- Plenty of extra power for tough jobs.
- Four massive cross slides for heavy forming cuts.
- Independent cam control for each slide.
- Smallest possible number of levers, links, pins and other small parts.
- Stock reel is indexed mechanically through gears.
- Accurate workmanship—permitting rapid production of parts to close tolerances.

Automatic Screw
Machines
Dies and Taps
Positive Centrifuges
The Chronolog
Contract Manufacturing

NATIONAL



Emsco Derrick and Equipment Company Finds New Screw Machines Are Money Savers

● Read what Mr. E. E. Stevenson, Chief Engineer of The D. & B. Division of Emsco Derrick and Equipment Co., of Los Angeles, said in a recent interview:

"At our Dallas plant automatic screw machines are producing the same parts as at the Los Angeles plant. But they do this work in 40% to 45% less time. The Dallas plant uses new National Acme machines."

Everywhere the new Model R machines are in use similar savings are reported. In many cases users say the new machines pay for themselves in less than a year!

Why not let one of our field engineers analyze your screw machines department—submit a report giving recommendations and estimated savings. There is no

obligation. It costs you nothing. It may save you plenty. Write us today.

The National Acme Company, Cleveland, Ohio

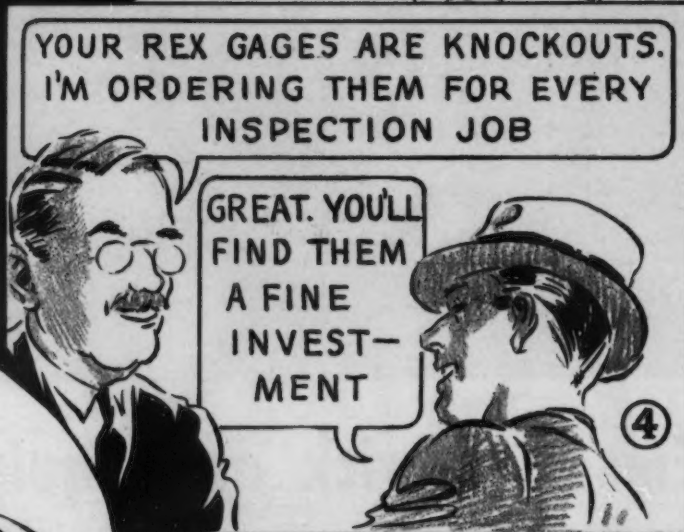
**WANT TO SAVE ON
CUTTING OIL?**

The cutting oil you use on your machine tools may be a lapping compound. National Acme Positive Clarifiers will remove the grit and dirt—restore the oil to its original purity. Cutting tools and machines stand up longer. The same machine will salvage your heat-treating oil, too—and remove grit from grinder compounds.

ACME

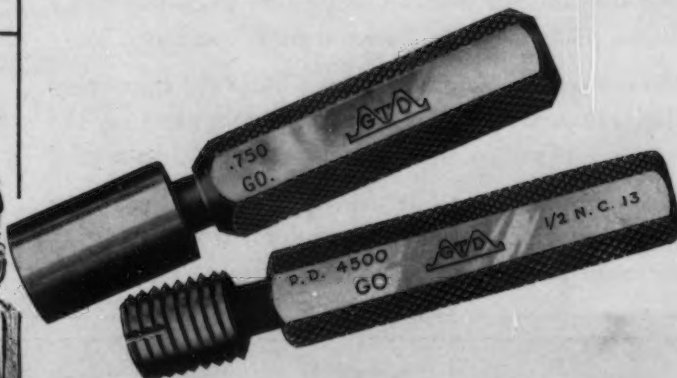
GRIDLEY AUTOMATICS

REX GAGES ENDURE AND INSURE



"Rex" finish is an exclusive surface treatment available on all types of "Greenfield" gages. If you want long life say "Rex".

GREENFIELD TAP & DIE CORPORATION
GREENFIELD, MASSACHUSETTS
Detroit Plant: 2102 West Fort Street
Warehouses in New York and Chicago
In Canada: Greenfield Tap & Die Corp. of Canada, Ltd., Galt, Ont.



GREENFIELD

LESS POWER

to compress each cubic foot of air

You can compress air with less power when you use PRE Compressors. These machines are doing the important big jobs in practically every class of industry, a fact which may be attributed to their high efficiency, economy, durability and reliability.

Ingersoll-Rand patented Channel Valves and other distinctive design features assure delivery of full rated capacity with a minimum of power per unit volume of air. High part load efficiencies are assured by Five-step Clearance Control.

Above is a portion of a recording watt-hour meter chart showing how Five-step Clearance-Control regulation carries a compressor from full load to no load in five steps.



A 4400-hp. installation of PRE Compressors.

EQUIPPED WITH THE

CHANNEL VALVE



Atlanta
Birmingham
Boston
Buffalo
Butte
Chicago
Cleveland
Dallas

Denver
Detroit
Duluth
El Paso
Hartford
Houston
Knoxville

Ingersoll-Rand

11 BROADWAY, NEW YORK CITY

Los Angeles
Newark
New York
Philadelphia
Picher
Pittsburgh
Pottsville

San Francisco
Seattle
St. Louis
Tulsa
Washington

ORDER FORMS FOR ALL DEPARTMENTS BY TELETYPEWRITER

SENDING orders is swift, accurate, and labor-saving with the form-writing feature of Bell System Teletypewriter Service. *Swift*, because orders typed by the sending machine are instantaneously reproduced by the receiving machine, 300 yards or 3000 miles away. *Accurate*, because your own company forms are synchronized on both machines to make possible exact, simultaneous typing.

By adding carbons, additional copies may be made for customer acknowledgment or for routing to the accounting, sales and other departments. This eliminates retyping and checking, expedites shipments, and permits more efficient control of widely separated factories and offices.

Typing-by-wire is the sure, modern way of speeding all kinds of messages. All types of businesses use it profitably. No doubt your business could too. A Bell System representative will help you find out. No obligation. Just call your local telephone office.

BELL SYSTEM TELETYPEWRITER SERVICE



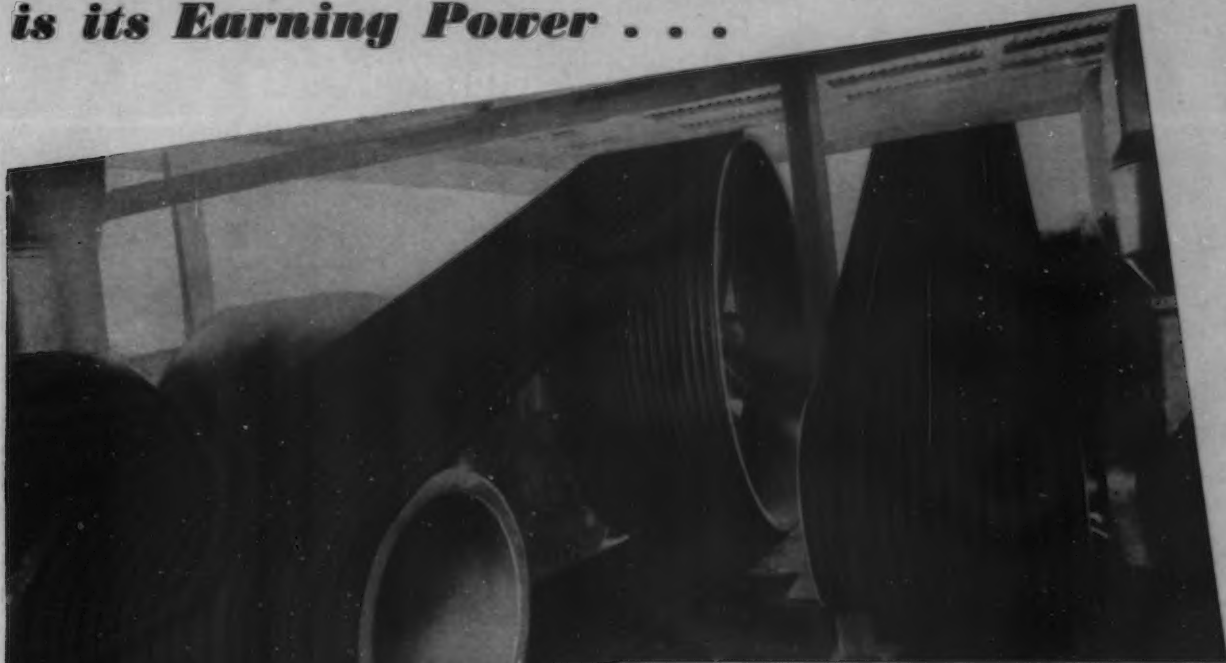
ACKNOWLEDGMENT
SALES DEPARTMENT
ACCOUNTING
LOADING ORDER
SHIPPING
INVOICE

ANY COMPANY, INC.
ANYWHERE, U. S. A.

SOLD BY R. V. MILLER
ORDER NO. 17133
DATE 5/21/37
SHIP FREIGHT
SOLD TO JONES BROS. INC.
711 JONES ST.
JONESBORO 1004

CONDOR WHIPCORD V-BELTS

*Industry's Turning Power
is its Earning Power . . .*



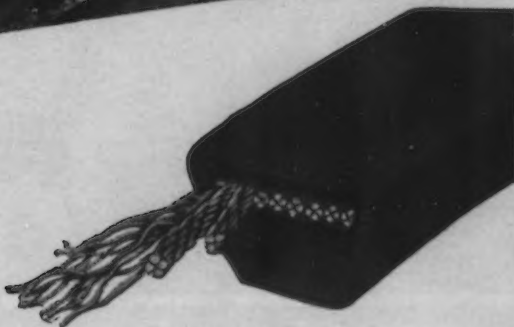
Condor Whipcord V-Belts on large electric driven slush pump in Oklahoma Oil Field

WITH the starting hum of the motor, Condor Whipcord V-Belts seat themselves firmly in the sheaves . . . pick up power smoothly . . . transmit it steadily, constantly to the driven unit.

Day in, day out the performance of Condor Whipcord V-Belts remains the same . . . slip, stretch, internal breakdown have been minimized by placing the endless whipcord strength member in the neutral axis area with an extensible section above, a compression section below.

This original Manhattan construction results in 9-Points of Balance that keep power, production and maintenance costs consistently lower . . . industry's profits consistently higher.

For more turning power . . . and greater earning power . . . put Condor Whipcord V-Belts on your drives. You will find their uniformity, balance and longevity, even in the most difficult service, will result in lower cost sheets.



Condor
PRODUCTS

Transmission Belt
V-Belt
Conveyor Belt
Air Hose
Contractors Hose
Sand Blast Hose
Suction Hose
Fire Hose
Hydraulic Hose
Steam Hose
Water Hose

Chute Lining
Launder Lining
Industrial Brake Blocks
and Lining
Molded Rubber Goods
Rubber Lined Tanks
Rubber Covered Rolls
Abrasive Wheels—
Rubber Bonded

9-POINT BALANCED CONSTRUCTION

1. Minimum Inelastic Stretch.
2. Wide Margin of Strength.
3. Uniform Flexibility.
4. Maximum Resistance to Structural Breakdown.
5. Smooth Running.
6. Maximum Traction.
7. High Resistance to Side Wear.
8. Correct Lateral Reinforcement.
9. Matched Length.



THE MANHATTAN RUBBER MFG. DIVISION
OF RAYBESTOS-MANHATTAN, INC.

EXECUTIVE OFFICE AND FACTORY, 44 TOWNSEND ST., PASSAIC, N. J.

when the Gulf Engineer is "in the picture"



... modern machines like these perform better



"THIS machine is built with the accuracy of a watch—and the timing of each operation must be exact," says this plant operator.

That is why the Gulf engineer is "in the picture." He recommends the use of lubricants which minimize wear and preserve close tolerances—assuring extreme accuracy in each operation.

Gulf engineers are well fitted to carry on

this cooperative work with plant men. Their knowledge and experience has been gained through intimate contact with scores of plants and hundreds of machines, new and old. They *know* how to make machinery run better by the scientific application of the proper lubricants. This service is extended to all users of Gulf quality lubricants—from Maine to Texas.

GULF OIL CORPORATION • GULF REFINING COMPANY

GENERAL OFFICES: GULF BUILDING, PITTSBURGH, PA.

MAKERS OF GULF NO-NOX ETHYL GASOLINE AND GULFPRIDE OIL

THE CHISELER



**CLARK ENGINEERING FOILS THE
PERSISTENT EFFORTS OF WEAR TO
SHORTEN THE LIFE OF CONTACTORS**

WEAR, little demon that he is, finds himself thwarted in every attempt he makes to destroy the Clark Contactor. He discovers to his chagrin that:

- 1 The arc shield is made of Carbofrax, practically impervious to arcing and heat.
- 2 The blow-out coil has more turns and a larger cross section. Result: greater magnetic effect and increased carrying capacity.
- 3 The blow-out coil is fastened securely to the terminal studs by Everdur bolts, which have approximately the same coefficient of expansion as copper.
- 4 The movable contact arm and main arm turn on renewable Nitralloy pins surrounded by renewable Nitralloy bushings—"Nitralloy to Nitralloy"—minimizing wear. Easily adjusted to maintain correct contact pressure.



THE CLARK CONTROLLER COMPANY

1146 EAST 122-4 STREET CLEVELAND, OHIO

Chiseled!



The Clark 300-ampere, single-pole contactor. Observe how in this trim, business-like Clark unit catter pins have been eliminated in both Movable Contact Arm and Main Arm. At all pivotal points—wherever there is relative motion—renewable Nitralloy pins and renewable Nitralloy bushings have been installed. The same features are found in the 100-, 150-, and 600-ampere contactors.



Exide-Ironclads bring out the best in your electric industrial trucks

POWER, Speed, Ruggedness, Long Life, Economy—these are built into the modern electric industrial truck. In order to turn these features to day-in and day-out advantage in your plant, select a battery possessing the same features. Standardize on Exide-Ironclad.

With their high power ability, Exide-Ironclad Batteries can give your material handling units practically unlimited power when needed. And their sustained voltage

assures productive speeds every hour of the day.

Exide-Ironclads not only speed up production—they cut costs. This is because of their long life, proved by the experience of hundreds of plants working to the limit of capacity. And economy is further increased by the low cost of battery maintenance. Let Exide-Ironclads speed up your material handling service and cut costs. Write for new free booklet, "Material Handling Systems and Equipment."

**Exide
IRONCLAD
BATTERIES**

With Exide MIPOR Separators
"MIPOR," Reg. U. S. Pat. Off.

THE ELECTRIC STORAGE BATTERY CO., Philadelphia
The World's Largest Manufacturers of Storage Batteries for Every Purpose
Exide Batteries of Canada, Limited, Toronto

Trucks illustrated made by the following companies:

- 1 Automatic Transportation Co., Inc.
- 2 Baker-Raulang Company
- 3 The Elwell-Parker Electric Company
- 4 The Yale & Towne Manufacturing Co.
- 5 Mercury Manufacturing Company



GOOD...
Way Back
 WHEN...

SEVENTY years of manufacturing experience bridge the production of these two pairs of LAMSON carriage bolts. Holding steadfastly to their job for 70 years—having to be cut out of the wooden parts they joined—the two old wrought iron bolts of LAMSON & SESSIONS' earliest manufacture reveal the existence of the integrity of materials and workmanship that has always been associated with the names of their makers.

Contrast them with LAMSON carriage bolts of today—made of heat treated steel, with threads so uniformly accurate that all

bolts and nuts of the same size are completely interchangeable—and at least 50% stronger than their predecessors.

LAMSON & SESSIONS' five plants—decentralized for service—invite your confidence as a thoroughly dependable source of supply. Besides large warehouse stocks at each plant, LAMSON jobbers maintain stocks throughout the country, immediately available for prompt shipments wherever you may be. THE LAMSON & SESSIONS COMPANY, General Offices, Cleveland, Ohio. Plants at Cleveland and Kent, Ohio; Chicago and Birmingham.

Your Jobber stocks the LAMSON Line

LAMSON & SESSIONS

Special Steels! FOR Special Uses!

made by the

ELECTRIC FURNACE
PROCESS

ALLOY STEELS
STAINLESS-CLAD
STEELS
HIGH SPEED STEEL
KNIFE STEELS
SAW STEELS
CLUTCH PLATE STEELS
TILLAGE STEELS
SHOVEL STEELS
ARMOR PLATE, ETC.



Plants:
New Castle, Indiana
Chicago, Illinois

Ingersoll Steel & Disc Division, Borg-Warner Corporation, specializes in the production of steels made by the Electric Furnace Process, in sheets and plates, to meet unusual service conditions.

INQUIRE
ESPECIALLY
ABOUT

TEM_xCROSS Trade
Mark

INGERSOLL
PROCESS
STEEL

which has a fine, interlocking mesh-grain structure that resists splitting and gives unusual wearing qualities. Address:

INGERSOLL STEEL & DISC DIVISION • BORG-WARNER CORPORATION
NEW CASTLE, INDIANA

A man in a dark suit stands on the left, looking up at a massive, towering mountain of mechanical parts and rejects. The mountain is composed of various gears, shafts, and metal components, creating a complex, textured surface. The title "Stymied by a MOUNTAIN of REJECTS" is written across the top of the mountain in a stylized font. "Stymied by a" is in script, while "MOUNTAIN of REJECTS" is in bold, block letters.

Stymied by a MOUNTAIN of REJECTS

Read how Shell
men helped this company
cut rejects to a minimum!

A LARGE Southern machine-parts company was using three or four different types of sulphurized and lead-base cutting oils, and still the inspectors were rejecting work because of inaccuracy and finish!*

Shell representatives were called in to make a complete study of the problem. Each cutting operation was analyzed . . . every tool and die examined.

Then the Shell men made their recommendation: A Shell Cutting Oil, especially compounded by Shell scientists to meet the severest test of cooling and pressure.

Today that Shell Cutting Oil is the standard lubricant in this shop! Lubricant costs have been reduced . . . tool life has been increased, "rejects" cut to a minimum.

The point to remember is this: That machine company's problem was solved when Shell scientists compounded this cutting oil. All the resources, ingenuity and cumulative experience of this great organization went into it. We call this "plus" in lubrication Shell's "Invisible Element!" It is ready to solve your lubrication problems—whatever they are, wherever you are. Call your nearest Shell office.

*An actual case history from Shell's files.



SHELL CUTTING OILS

HEAT TREATING FOR PROFITS

More uniform results, lower cost
and bigger profits for you with
modern **GAS** equipment

TODAY'S new and modern industrial gas equipment gives you important advantages that mean real dollars and cents savings and extra profits for you.

New and improved automatic controls give you better and more uniform results at lower costs. More effective insulation cuts fuel cost and improves working conditions; furnaces are cooler to work around. And you will find, too, that modern gas equipment is designed to fit in with the most modern plant layouts—from the simplest layout of the small plant to the most exacting layout of the large plant.

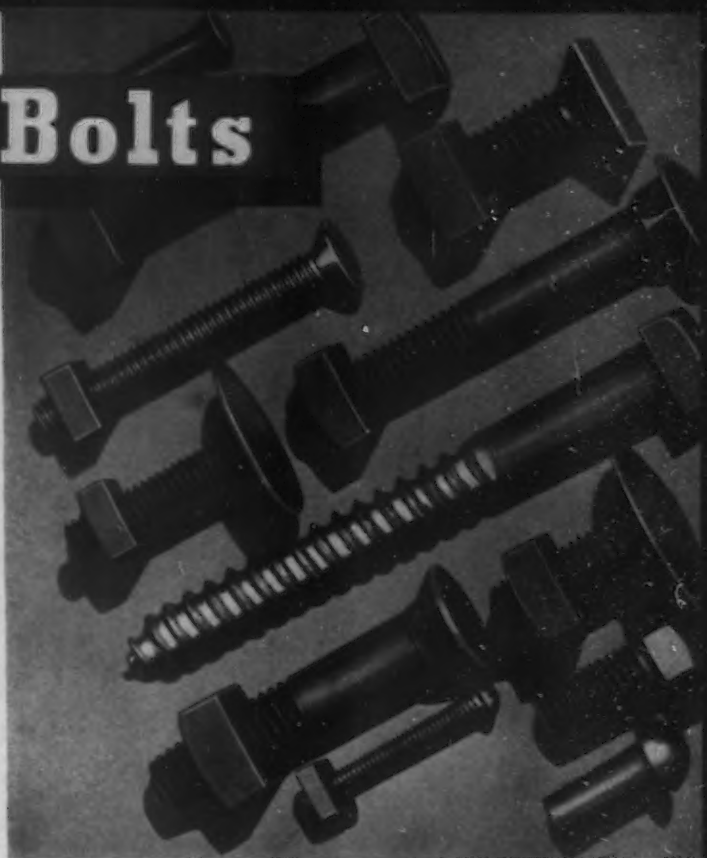
Ask your gas company for more detailed information on modern gas equipment—and for facts and figures on how it can cut costs and increase profits for you.



AMERICAN GAS ASSOCIATION

INDUSTRIAL GAS SECTION: 420 LEXINGTON AVE., NEW YORK

EMPIRE Small Bolts



Even a BOLT can have CHARACTER

EVER since the founding of the business in 1845, nearly a century ago, Russell, Burdsall & Ward has built character into its products. For instance, on the entire line of EMPIRE Small Bolts, R B & W quality and precision have always been outstanding—the study, skill and control that have been devoted to these smaller sizes have resulted in unusual leadership and prestige.

R B & W obtains greater *mechanical* accuracy on EMPIRE Small Bolts due to specially designed automatic machinery, controlled preparation of raw material and improved methods of production—obtains better *human* accuracy because of the invaluable experience, skill and interest of workmen, the majority of whom have been trained to R B & W precision and quality over a long period of years.

EMPIRE Small Bolts have exceptionally well finished heads, smooth bodies, clean threads, and are accurate in lead and pitch. Their use speeds assembly and assures precision of fastening because they are strong—uniform—right. Their outstanding characteristics have built their character.

RUSSELL, BURDSALL & WARD
BOLT AND NUT COMPANY





SINCE 1845..



EACH succeeding year of R B & W history has progressively strengthened and developed the sound policies established when the business began.

New and better raw materials have come into use, yet rigid inspection, strict metallurgical tests and careful preparation for manufacture are as closely enforced today as ever before. New and improved precision machinery has been developed, but, as in the past, most of the new ideas in Bolt, Nut and Rivet manufacture are still emanating from R B & W plants. Greater accuracy in finished product, with closer tolerances and cleaner finishes, is expected today, yet here again R B & W has led the way with more progressive methods of manufacture, control and inspection. Increased production facilities and larger stocks are required today—and R B & W continues to meet such demands with three strategically located plants and thousands of feet of storage space, carrying the widest range of types and sizes. The number of customers, spread over world-wide territory, with more diversified requirements, has grown; and here, too, R B & W has met the situation through Advisory Engineers, Sales Offices, Sales Service Men, Distributors, Jobbers and Retailers.

Thus since 1845, age and experience have improved R B & W products and service—so that today, as then, EMPIRE Bolts, Nuts and Rivets represent the world's standard of Leadership and Quality.

BOLTS

Carriage • Machine • Lag • Plow
Stove • Elevator • Step • Tap
Wire Wheel & Rim • Battery
U-Bolts • Semi-Finished
Automotive Replacement

NUTS

Cold Punched • Semi-Finished
Hot Pressed • Case Hardened
Slotted • Castle

PINS

Clevis • Hinge

RIVETS

Standard
Tinners' • Coopers' • Culvert

SCREWS

Cap • Machine • Hanger

WASHERS

Plate • Burrs

MATERIALS

Alloys
Steels • Non-ferrous Metals

RODS

Stove • Seat • Ladder

PLATED PARTS

Cadmium • Zinc • Chromium
Nickel • Hot Galvanized • Copper
Tin

SPECIAL UPSET AND PUNCHED PRODUCTS

RUSSELL, BURDSALL & WARD
BOLT AND NUT COMPANY

PLANT CHICAGO, ILL. BRANCHES FALLS, ILL. CORAOPOLIS, PA.

SOLE AGENTS: RUSSELL, BURDSALL & WARD, 100 N. WABASH ST., CHICAGO, ILL.

ESTABLISHED 1845



A GRIP THAT REALLY HOLDS



UNSHAKO
**SELF-LOCKING
NUT**

Fig. 1510 (Above). Cutout section of UNSHAKO Nut, showing Locking Ring in position.

Once in, no amount of jarring or vibration can loosen the UNSHAKO Self-Locking Nut. (*Yet it backs off easily with the aid of an ordinary wrench.*)

The built-in, self-locking ring or floating thread holds it fast (without fuss with straying pins or washers) and absolutely prevents accidents and failures from loosened nuts in vibration wracked machines.

Complete information and prices cheerfully furnished.

STANDARD PRESSED STEEL CO.

BRANCHES

BOSTON

DETROIT

INDIANAPOLIS

JENKINTOWN, PENNA.

Box 523

BRANCHES

CHICAGO

ST. LOUIS

SAN FRANCISCO

ACHIEVEMENTS IN FLEXIBILITY,
EFFICIENCY AND CONVENIENCE
IN THE MODERN

SHUSTER

DUAL CONTROL
AUTOMATIC WIRE STRAIGHTENING
AND CUTTING MACHINES

Modern machine tool design.

Anti-friction bearing equipped—heat treated roll gears enclosed in housing and run in oil.

Variable Speed Units give infinite speeds for various qualities of wire, increasing production, and decreasing costs.



THE F. B. SHUSTER COMPANY, NEW HAVEN, CONN.
Straightener Specialists Since 1866

CROSBY *for* STAMPINGS

Serving Industry Since 1896



ALL our efforts
have been concentrated on
one product — STAMP-
INGS—for 40 years. We
have made stampings,
deep, intricate, heavy, light,
large and small, for nearly
every branch of industry.



Get Acquainted With Crosby Service

THE CROSBY COMPANY

General Offices and Works: BUFFALO, NEW YORK

Branch Offices: Chicago Detroit Cleveland New York Philadelphia

Stinging, Stabbing JETS OF STEAM

"**H**ELP us fight the erosive, cutting effect of high velocity steam on valve parts," was the cry that came from many industries.

So Crane shot stinging, stabbing jets of steam, hour after hour, day after day, at specimens of many metals. As the result of such extensive research and testing, Crane was able to find the relative resistances of these metals to erosion... and to develop a metal suitable for

service where wire-drawing is encountered.

That is why so many valve and fitting problems are readily solved by using standard Crane products. Look in your new Crane No. 52 Catalog for details of the 38,000 items and dimensions, tested in the laboratory and proved on the job. Use it when you need valves, fittings, pipe or accessories. CranEquip for satisfaction.

CRANE

CRANE CO., GENERAL OFFICES: 836 S. MICHIGAN AVENUE, CHICAGO, ILLINOIS

Branches and Sales Offices in One Hundred and Sixty Cities

VALVES, FITTINGS, FABRICATED PIPE, PUMPS, PLUMBING AND HEATING MATERIAL

...hundreds more will be applied in the next few days.

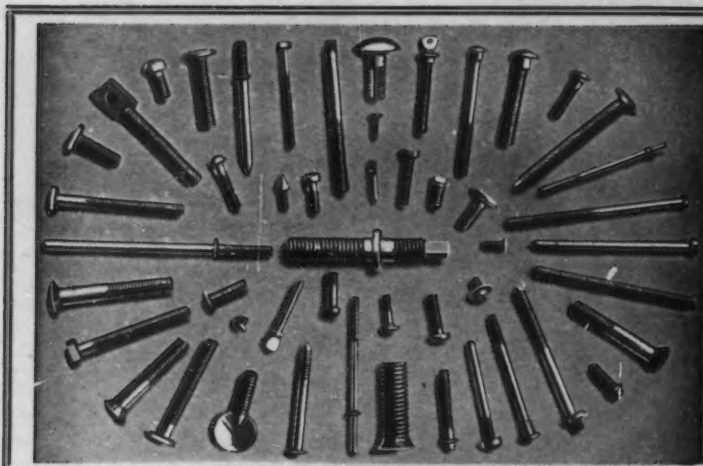
GREAT OPPORTUNITY FOR CRANEQUIPPING ADVANTAGES



BIRMINGHAM, ALA., May 10—New construction in the iron and steel industry offers a great opportunity for mill men to get the advantages of CranEquipment.

When the plans are on the boards and specifications are being made up, your Crane No. 52 Catalog is a valuable constant companion. It is packed with useful engineering data on all piping problems—and fairly bulges with the details of valves, fittings, piping and piping accessories that make specifying easy.

CranEquipping a new plant means the economy of standardization, the dependability of highest quality, the responsibility of a single source for service. And if new problems complicate your designing, you can call on the broad experience of Crane engineers to help you plan your piping. A line to Crane and the aid of the largest valve and fitting organization in the world is at your command.



WHEN IN NEED OF

MACHINE SCREWS
MACHINE SCREW NUTS

SPECIAL STUDS
SPECIAL SCREWS

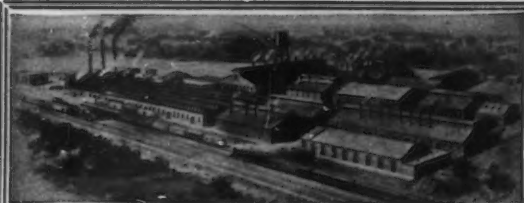
COMMUNICATE WITH
THE HOUSE OF SERVICE

THE PROGRESSIVE MANUFACTURING CO.
TORRINGTON, CONN.

We please those discriminating manufacturers who not only demand quality but service as well. Business goes where it is invited and remains where it is well treated. The illustration reveals a few only of the possibilities that are developed by the cold heading process.

HOLCROFT & COMPANY

LEADERS IN BUILDING AND DESIGNING ELECTRIC
AND COMBUSTION FURNACES, KILNS AND OVENS.
HOME OFFICE: DETROIT—BRANCHES: CHICAGO, PHILADELPHIA
CANADA: WALKER METAL PRODUCTS, LTD., WALKERVILLE, ONT.



THE ATHENIA STEEL CO.

Clifton Ave., Clifton, N. J.

Works, Athenia, N. J.

Makers of High Grade Tempered and Polished Steel for Clock, Watch, Motor and Typewriter Springs. Also Wound Springs. Tempered and Untempered Steel for other purposes. Special quality equal to finest imported for finish and accurate rolling. Also Stainless Steels of various grades.

AGENTS:—

Lapham Hickey Co.—3333 W. 47th Place, Chicago, Ill.—414 United Artists Bldg., Detroit, Mich.
E. F. Krause & Co.—430-440 Commercial St., Los Angeles, Calif.
Hill Chase & Co.—Richmond and Ontario Sts., Philadelphia, Pa.
Wetherell Bros. Co.—251 Albany St., Cambridge, Mass.

THE CREAM AT THE TOP

...Real quality identifies itself. Whether it be cream, or men, or hotels, outstanding performance is given top ranking. Few hotels in the world hold as prominent a place as the Stevens. To experienced world travelers, "The Stevens" represents the cream of American hospitality, a tradition of excellence without extravagance.

OTTO K. EITEL, Managing Director



Room, with Bath, from \$3

In the heart of Unspoiled Vermont not far from the entrance to the famous Green Mountain Long Trail!!

TRUE TEMPER INN

WALLINGFORD, VERMONT



A truly colonial Inn with every modern convenience, charm, comfort and quiet luxury.

Summer Sports of All Kinds, Good Food, Real Vermont Hospitality and the friendly service of a Treadway Inn combine to make an ideal vacation.

Open to October

C. A. Danolds, Resident Manager

14,295

PAID SUBSCRIPTIONS

82% of which

ARE REPEAT ORDERS

JUST BETWEEN US TWO

If You Like It, Don't Take It

TWENTY years or so ago no sensible patent medicine manufacturer could turn out a product with a pleasant taste. It wouldn't sell, for if it didn't taste bad, how could it be any good for you?

And you will recall that when anaesthetics were first introduced there was considerable objection to their use on the grounds that they weren't quite kosher. Man was made to suffer, and none of this defeating the Divine will.

In pedagogical circles the belief that there is something unethical in taking the painfulness out of learning still reigns, despite evidence that boredom shortens, rather than lengthens, the period of retention.

As proof that learning can be pleasureable we cite "*Morgan Supplants Garrett at Joliet*," by Tom Lippert, page 30 of the June 24 Iron Age. Of it, A. W. Miller writes:

"A real masterpiece. The best thing yet. It certainly shows the well-stored mind and the complete background. And besides those, a disciplined imagination, a pleasing literary style, and a gift for graphic phraseology."

Carrying on for Calvin

PRAISE like that, given in 16-oz. pounds, is distressing to our Oberleutnant, whose idea of shooting the works is, "*It isn't half bad*," followed with, "*That is, on first thought. There may be objections. . .*"

A man after the Oberleutnant's own heart is the Solvay, N. Y., man who writes:

"Your magazine has proven interesting, and, I think, educational."

Our guess is that this reader is a bachelor, or if he has a wife, his married life is not exactly ecstatic owing to his habit of meting out praise by Troy weight—24 grains, 1 pennyweight; 20 pennyweights, 1 ounce, etc.

We Thought They Rolled Their Own

BUT the Solvay gentleman has taught us a lesson in exactness. We have been boasting loosely that all kinds of metal products are made by Iron Age subscribers and find after checking a trade directory that we didn't know what we were talking about.

For instance, in Canton, Ohio, there is a non-subscriber named the Curthalt Co. which makes automatic pretzel tying machines. In Wareham, Mass., the Hayden Cranberry Separator Mfg. Co. makes—you'll never guess it—cranberry separators, and in Somerville, Mass., the Tuners Supply Co. supplies the craving for piano tuners' tools.

Not one of them gets The Iron Age, and why we didn't check up on these things before making our sweeping claim, we don't know. We just never thought of automatic pretzel tying machines and piano tuners' tools, and hereafter when we boast, we will always throw in, as did the Solvay gentleman, a qualifying, "We think."

Stopper

WATER never hurt a duck!—Simplex Wire & Cable Co.

Wire-Pushing

"From there the steel moves through the various plants, to be rolled into smaller bars, to be pushed through dies and come out as wire. . ."—New York Herald Tribune.

Soul-Saving, Collect

A PIOUS, anonymous Middletown, Conn., resident uses one of our self-addressed "we-pay-postage" envelopes to send us this message:

"The world needs the Lord. He needs you. God bless you."

We are grateful, but not four cents' worth.

Maybe They Sat on the Table

OUR money is on that leisureless lady, Eleanor Roosevelt, to win the contest to see who can register the greatest distance between verbs and modifying adverbs. She said in her June 24th stint:

"I enjoyed the evening and the opportunity to talk to Mr. Melcher and Mr. Guinsburg, who were neighbors at my table, very much."

—A.H.D.



To gain the greatest time saving in Contour Metal Sawing, an exact control of speeds is necessary. This the DOALL offers through an infinitely variable cutting speed, gained with V-type variable pulleys that eliminate gears. The running speed suitable for any one of 48 materials is easily secured from the Job Selector Dial shown above, and the speed of the machine set at this point. Versatility in material cutting makes the DOALL the busiest machine in any tool room.

DOALL KEEPS PRODUCTION SCHEDULES UP TO DATE

Shortage of skilled labor, shorter working hours make the use of time saving, modern equipment essential. Learn for yourself why comments such as these are typical of DOALL:

"A great deal of work we have been doing on the shaper we now do in a fraction of the time." Dresel-Betz, Belleville, Illinois.

"We have made some remarkable savings in cutting out dies as well as for a lot of special work." Trumbull Electric Mfg. Co., Plainville, Conn.

"Our toolmakers are pleased." Baldwin Duckworth Chain Corp.

FOR ACTION . . .

1. Write for quotation.
2. Arrange for free demonstration of DOALL in your plant.
3. Send for Handbook, mailed free when requested on business letterhead.



CONTINENTAL MACHINE SPECIALTIES
1301 South Washington Avenue
MINNEAPOLIS MINNESOTA

Conomatics and Cone Automatics

Are economical and accurate producers of screw machine parts up to 6" diameter, 7" milling length. They cut costs, increase production, boost profits.

Write for particulars

CONE AUTOMATIC MACHINE CO., Inc.

WINDSOR, VERMONT

REPRESENTATIVES:

Detroit: J. C. Austerberry's Sons, 332 Curtis Bldg., Detroit, Mich.
Chicago: John H. Glover, 2127 North Sayre Ave., Chicago, Ill.
Ohio: S. B. Martin, 1077 Erie Cliff Drive, Lakewood, Ohio.
New England: Potter & Johnston Machine Co., Pawtucket, R. I.
Indiana: G. A. Richey, Chamber of Commerce Bldg., Indianapolis, Ind.
New York State: Syracuse Supply Co., Syracuse, N. Y.; also Buffalo, N. Y.

Pennsylvania: Arch Machinery Co., 1029 Park Bldg., Pittsburgh, Pa.
California: C. F. Bulotti Machinery Co., 329-331 Folsom St., San Francisco, Calif.
Eccles & Davis Machinery Co., Inc., 1919 Santa Fe Avenue, Los Angeles, California.
Arthur Jackson Machine Tool Company, 60 Front Street West, Toronto 3, Canada, and 437 Grosvenor Avenue, Westmount, Que.

GOSS and DE LEEUW

MULTIPLE SPINDLE

CHUCKING MACHINES

Two, Four, Five Spindles • Work and Tool Rotating Types
 GOSS & DE LEEUW MACHINE CO., NEW BRITAIN, CONN.

LELAND-GIFFORD COMPANY

Worcester, Mass.

Drilling Machinery
 Belt and Motor Spindle
 One to Six Spindles

Tapping Attachments and Multiple Heads

"METALINE"

(REGISTERED TRADE MARK)

OILLESS BRONZE BEARINGS

R. W. RHOADES METALINE CO., INC.

43-3RD ST. LONG ISLAND CITY, N. Y.

FRICITION FEARS THIS FOE

Rely on Abbott for steel balls in precision and commercial tolerances.



THE ABBOTT BALL COMPANY
 1047 New Britain Ave., Hartford, Conn.

ABBOTT BEARING BALLS

In The

IRON AGE

you contact 70,134

readers

Products Index

- ABRASIVE WHEELS**—See Grinding Wheels
- ABRASIVE CLOTH & PAPER**
 Norton Co., Worcester, Mass.
- ABRASIVES**—Steel Shot and Grit
 Pangborn Corporation, Hagerstown, Md.
- ACCESSORIES**—Welding
 Lincoln Electric Co., The, Cleveland.
- ACCUMULATORS**—Hydraulic
 Baldwin-Southwark Corp., Southwark Div., Philadelphia.
- Hydraulik GmbH**, Duisburg, Germany.
- Wood, R. D. & Co.**, Philadelphia.
- ACETYLENE**—Dissolved in Cylinders & Small Tanks
 Air Reduction Sales Co., 60 East 42nd St., N. Y. C.
- Linde Air Prods. Co.**, The, 30 East 42nd St., N. Y. C.
- ACID-PROOF CEMENT**
 Pennsylvania Salt Mfg. Co., Philadelphia, Pa.
- ACID-PROOF CONSTRUCTION**
 Atlas Mineral Prods. Co. of Pa., The, Merittstown, Pa.
- ACIDS**—Pickling
 American Chemical Paint Co., Ambler, Pa.
 Du Pont de Nemours, E. I., & Co., Inc., Grasselli Chemicals Dept., Wilmington, Del.
- Pennsylvania Salt Mfg. Co.**, Philadelphia, Pa.
- AIR CONDITIONING EQUIPMENT**
 American Blower Corp., 6000 Russell St., Detroit.
- Clarae Fan Co.**, Kalamazoo, Mich.
- AIR TANKS AND CYLINDERS**
 Petroleum Iron Works Co., The, Sharon, Pa.
 Scaife, William B., & Sons Co., Pgh.
- ALLOYS**—Copper
 American Brass Co., The, Waterbury, Conn.
- ALLOYS**—Ferro
 Electro Metallurgical Sales Corp., 30 East 42nd St., N. Y. C.
- ALLOYS**—Magnesium
 Dow Chemical Co., The, 921 Jefferson Ave., Midland, Mich.
- ALLOYS**—Phosphor Bronze
 Phosphor Bronze Smelting Co., The, Phila. Riverside (N. J.) Metal Co.
- ALLOYS**—Resistance Welding
 Electroloy Co., Inc., 50 Church St., New York City.
- ALLOYS**—Titanium
 Titanium Alloy Mfg. Co., The, Niagara Falls, N. Y.
- ALLOYS**—Tungsten
 Vanadium Corp. of America, 420 Lexington Ave., N. Y. C.
- ALLOYS**—Vanadium
 Vanadium Corp. of America, 420 Lexington Ave., N. Y. C.
- ALLOYS**—Zinc Base Die Casting
 New Jersey Zinc Co., The, 160 Front St., N. Y. C.
- ALUMINUM**
 Aluminum Co. of America, Pittsburgh.
- Seligman, Arthur & Co., Inc.**, 30 Rockefeller Plaza, R. C. A. Bldg., N. Y. C.
- AMMETERS AND VOLTMETERS**—Recording
 Leeds & Northrup Co., Philadelphia.
- AMMONIA RECOVERY PLANTS**
 Koppers Co., Pittsburgh.
- ANGLES, BEAMS, CHANNELS AND TEES**
 Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.
- Columbia Steel Co.** (U. S. Steel Corp. Subsidiary), San Francisco, Calif.
- Inland Steel Co.**, Chicago.
- Jones & Laughlin Steel Corp.**, Pittsburgh.
- Ryerson, Jos. T. & Son, Inc.**, Chicago.
- Scully Steel Products Co.** (U. S. Steel Corp. Subsidiary), Chicago.
- Steel & Tubes, Inc.**, Cleveland.
- Tennessee Coal, Iron & Railroad Co.** (U. S. Steel Corp. Subsidiary), Birmingham, Ala.
- Weirton (W. Va.) Steel Co.**
- ANGLES, BEAMS, CHANNELS & TEES**—Magnesium Alloys
 Dow Chemical Co., The, 921 Jefferson Ave., Midland, Mich.
- ANNEALING**—See Heat Treating
- ANNEALING BOXES**
 Lebanon (Pa.) Steel Foundry.
- Petroleum Iron Works Co.**, The, Sharon, Pa.
- United Engineering & Fdry. Co.**, Pgh.
- ANNEALING COVERS**
 Petroleum Iron Works Co., The, Sharon, Pa.
- Surface Combustion Corp.**, 2375 Dorst St., Toledo.
- ANODES**—All Types
 Du Pont de Nemours, E. I., & Co., Inc., Grasselli Chemicals Dept., Wilmington, Del.
- Seymour (Conn.) Mfg. Co.**
- Udyette Co.**, The, Detroit.
- ANODES**—Cadmium
 Du Pont de Nemours, E. I., & Co., Inc., Grasselli Chemicals Dept., Wilmington, Del.
- Udyette Co.**, The, Detroit.
- APPAREL**—Welding
 Lincoln Electric Co., The, Cleveland.
- ARBORS**
 Cincinnati (Ohio) Milling Mch. Co., The.
- Morse Twist Drill & Mch. Co.**, New Bedford, Mass.
- ARMORING MACHINERY**—Cable, Wire, Hose
 Sleeper & Hartley, Inc., Worcester, Mass.
- ARRESTERS**—Spark
 Harrington & King Perforating Co., Chicago.
- ASBESTOS**
 Carey, Philip, Co., The, Cincinnati.
- AXLES**—Car or Locomotive
 Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.
- BALANCING EQUIPMENT**
 Clisbolt Machine Co., Madison, Wis.
- BALING PRESSES**—Scrap—See Presses—Baling
- BALLS**—Burnishing
 Abbott Ball Co., The, 1047 New Britain Ave., Hartford, Conn.
- Hartford (Conn.) Steel Ball Co.**, The.
- BALLS**—Steel, Brass or Bronze
 Abbott Ball Co., The, 1047 New Britain Ave., Hartford, Conn.
- Hartford (Conn.) Steel Ball Co.**, The.
- New Departure Div., General Motors Corp.**, Bristol, Conn.
- SKF Industries, Inc.**, Front St. & Erie Ave., Phila., Pa.
- BANDS**—Steel
 Acme Steel Co., Chicago.
- Tennessee Coal, Iron & Railroad Co.** (U. S. Steel Corp. Subsidiary), Birmingham, Ala.
- BANDS**—Welded
 Amer. Welding & Mfg. Co., Warren, O.
- BARRELS**—Burnishing
 Abbott Ball Co., The, 1047 New Britain Ave., Hartford, Conn.
- Ransohoff, N., Inc.**, Cincinnati.
- BARRELS**—Tumbling
 Baird Mch. Co., The, Bridgeport, Conn.
- Hartford (Conn.) Steel Ball Co.**, The.
- Ransohoff, N., Inc.**, Cincinnati.
- Whitling Corp.**, Harvey, Ill.
- BARS**—Alloy
 Republic Steel Corp., Cleveland, Ohio.
- BARS**—Aluminum
 Aluminum Co. of America, Pittsburgh.
- BARS**—Brass, Bronze or Copper
 Bunting Brass & Bronze Co., Toledo, Ohio.
- Johnson Bronze Co.**, 505 So. Mill St., New Castle, Pa.
- BARS**—Cold Drawn
 American Steel & Wire Co. (U. S. Steel Corp. Subsidiary), Chicago.
- Bliss & Laughlin, Inc.**, Harvey, Ill.
- Union Drawn Steel Co.**, Massillon, Ohio.
- BARS**—Concrete, Reinforcing
 Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.
- Columbia Steel Co.** (U. S. Steel Corp. Subsidiary), San Francisco, Calif.
- Jones & Laughlin Steel Corp.**, Pittsburgh.
- Laclede Steel Co.**, St. Louis, Mo.
- Tennessee Coal, Iron & Railroad Co.** (U. S. Steel Corp. Subsidiary), Birmingham, Ala.
- BARS**—Magnesium Alloys
 Dow Chemical Co., The, 921 Jefferson Ave., Midland, Mich.
- BARS**—Steel
 Ames, W., & Co., Jersey City, N. J.
- Andrews Steel Co.**, The, Newport, Ky.
- Bethlehem (Pa.) Steel Company.**
- Carnegie-Illinois Steel Corp.** (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.
- Great Lakes Steel Corp.**, Detroit.
- Inland Steel Co.**, Chicago.
- Jones & Laughlin Steel Corp.**, Pittsburgh.
- Republic Steel Corp.**, Cleveland, Ohio.
- Ryerson, Jos. T. & Son, Inc.**, Chicago.
- Scully Steel Products Co.** (U. S. Steel Corp. Subsidiary), Chicago.
- Steel & Tubes, Inc.**, Cleveland.
- Tennessee Coal, Iron & Railroad Co.** (U. S. Steel Corp. Subsidiary), Birmingham, Ala.
- Timken Roller Bearing Co.**, The, Canton, O.
- Timken Steel & Tube Div.**, The Timken Roller Bearing Co., Canton, O.
- Weirton (W. Va.) Steel Co.**
- Youngstown (Ohio) Sheet & Tube Co.**, The.
- BATTERIES**—Storage
 Electric Storage Battery Co., The, Phila.
- BATTERY CHARGERS**
 Cutler-Hammer, Inc., Milwaukee.
- BEAMS**—See Angles, Beams, Channels and Tees
- BEARINGS**—Babbitt
 Johnson Bronze Co., 505 So. Mill St., New Castle, Pa.
- BEARINGS**—Ball
 Bantam Bearings Corp., The, South Bend, Indiana.
- Federal Bearings Co., Inc.**, The, Poughkeepsie, N. Y.
- New Departure Div., General Motors Corp.**, Bristol, Conn.
- Norma-Hoffmann Bearings Corp.**, Stamford, Conn.
- SKF Industries, Inc.**, Front St. & Erie Ave., Phila., Pa.
- Schats Mfg. Co.**, Poughkeepsie, N. Y.

Products Index

BEARINGS—Brass and Bronze
 Ampco Metal, Inc., Milwaukee, Wis.
 Bunting Brass & Bronze Co., Toledo, O.
 Johnson Bronze Co., 605 So. Mill St., New Castle, Pa.
 Lawrenceville Bronze Co., Pittsburgh.
 National Bearing Metals Corp., Pittsburgh.

BEARINGS—Oilless
 Bunting Brass & Bronze Co., Toledo, O.
 Rhoades, E. W., Metaline Co., Inc., Long Island City, N. Y.
 Richardson Co., The, Melrose Park, Ill.

BEARINGS—Quill
 Bantam Bearings Corp., The, South Bend, Indiana.

BEARINGS—Radial
 Bantam Bearings Corp., The, South Bend, Indiana.
 Federal Bearings Co., Inc., The, Poughkeepsie, N. Y.
 Hyatt Bearings Div., General Motors Corp., Newark, N. J.
 New Departure Div., General Motors Corp., Bristol, Conn.
 Norma-Hoffmann Bearings Corp., Stamford, Conn.
 SKF Industries, Inc., Front St. & Erie Ave., Phila., Pa.
 Schatz Mfg. Co., The, Poughkeepsie, N. Y.
 Shafer Bearing Corp., 35 East Wacker Drive, Chicago.

BEARINGS—Roll Neck
 Bantam Bearings Corp., The, South Bend, Indiana.
 Morgan Construction Co., Worcester, Mass.
 SKF Industries, Inc., Front St. & Erie Ave., Phila., Pa.
 Shafer Bearing Corp., 35 East Wacker Drive, Chicago.
 Timken Roller Bearing Co., The, Canton, O.

BEARINGS—Roller
 Bantam Bearings Corp., The, South Bend, Indiana.
 Hyatt Bearings Div., General Motors Corp., Newark, N. J.
 Norma-Hoffmann Bearings Corp., Stamford, Conn.
 SKF Industries, Inc., Front St. & Erie Ave., Phila., Pa.
 Shafer Bearing Corp., 35 East Wacker Drive, Chicago.
 Standard Machinery Co., Providence, R. I.
 Timken Roller Bearing Co., The, Canton, O.

BEARINGS—Roller Tapered
 Bantam Bearings Corp., The, South Bend, Indiana.
 Timken Roller Bearing Co., The, Canton, O.

BEARINGS—Rolling Mill Equipment
 Bantam Bearings Corp., The, South Bend, Indiana.
 Richardson Co., The, Melrose Park, Ill.
 SKF Industries, Inc., Front St. & Erie Ave., Phila., Pa.
 Timken Roller Bearing Co., The, Canton, O.

BEARINGS—Self-aligning Roller
 Shafer Bearing Corp., 35 East Wacker Drive, Chicago.

BEARINGS—Shaft Hanger
 Hyatt Bearings Div., General Motors Corp., Newark, N. J.
 Norma-Hoffmann Bearings Corp., Stamford, Conn.
 SKF Industries, Inc., Front St. & Erie Ave., Phila., Pa.
 Shafer Bearing Corp., 35 East Wacker Drive, Chicago.

BEARINGS—Thrust
 Bantam Bearings Corp., The, South Bend, Indiana.
 Federal Bearings Co., Inc., The, Poughkeepsie, N. Y.
 Hyatt Bearings Div., General Motors Corp., Newark, N. J.
 New Departure Div., General Motors Corp., Bristol, Conn.
 Norma-Hoffmann Bearings Corp., Stamford, Conn.
 SKF Industries, Inc., Front St. & Erie Ave., Phila., Pa.
 Schatz Mfg. Co., The, Poughkeepsie, N. Y.
 Shafer Bearing Corp., 35 East Wacker Drive, Chicago.
 Timken Roller Bearing Co., The, Canton, O.

BELT DRESSING
 Rhoades, J. E. & Sons, Philadelphia.

BELT LACING
 Rhoades, J. E. & Sons, Philadelphia.

BELT—Conveyor, Elevator
 Goodrich, B. F. Co., The, Akron, Ohio.
 Manhattan Rubber Mfg. Div. of Raybestos-Manhattan, Inc., The, 2 Townsend St., Passaic, N. J.

BELTING—CEMENT
 Rhoades, J. E. & Sons, Philadelphia.

BELTING—Leather
 Chicago (Ill.) Rawhide Mfg. Co., The, 1304 Eiston Ave.
 Rhoades, J. E. & Sons, Philadelphia.

BELTING—Metal, Conveyor, High and Low Temperature
 Acme Steel Co., Chicago, Ill.
 Wickwire Spencer Steel Co., 41 East 42nd St., N. Y. C.

BELTING—Rubber
 Goodrich, B. F. Co., The, Akron, Ohio.
 Goodyear Tire & Rubber Co., Akron, Ohio.
 Manhattan Rubber Mfg. Div. of Raybestos-Manhattan, Inc., The, 2 Townsend St., Passaic, N. J.
 Robins Conveying Belt Co., 15 Park Row, N. Y. C.

BELTS—V-Type
 Allis-Chalmers Mfg. Co., Milwaukee.
 Manhattan Rubber Mfg. Div. of Raybestos-Manhattan, Inc., The, 2 Townsend St., Passaic, N. J.

BENCH LEGS—Steel
 New Britain-Gridley Machine Div., The
 New Britain Machine Co., New Britain, Conn.

BENDING MACHINES—Hand, Band and Angle
 Excelsior Tool & Mch. Co., E. St. Louis, Ill.

BENDING MACHINES—Hand and Power
 Cincinnati (Ohio) Shaper Co., The.
 Dreis & Krump Mfg. Co., Chicago.
 G. D. A. Shearing & Punching Machine Co., 101 Walker St., N. Y. C.
 Kane & Roach, Inc., Syracuse, New York.
 Niagara Machine & Tool Works, Buffalo, N. Y.

BENZOL RECOVERY PLANTS
 Koppers Co., Pittsburgh.

BERYLLIUM COPPER
 American Brass Co., The, Waterbury, Conn.
 Riverside (N. J.) Metal Co.

BILLETS—Alloy Steel
 Andrews Steel Co., The, Newport, Ky.

BILLETS—Carbon Steel
 Andrews Steel Co., The, Newport, Ky.

BILLETS—Carbon Vanadium Steel
 Andrews Steel Co., The, Newport, Ky.

BILLETS—Chrome Nickel Steel
 Andrews Steel Co., The, Newport, Ky.

BILLETS—Chrome Steel
 Andrews Steel Co., The, Newport, Ky.

BILLETS—Die Block Steel
 Andrews Steel Co., The, Newport, Ky.

BILLETS—Forging
 Alan Wood Steel Co., Conshohocken, Pa.
 Andrews Steel Co., The, Newport, Ky.
 Central Iron & Steel Co., Harrisburg, Pa.
 Harrisburg (Pa.) Steel Corp.
 Midvale Co., The, Nicetown, Phila., Pa.
 Republic Steel Corp., Cleveland, Ohio.

BILLETS—Nickel Steel
 Andrews Steel Co., The, Newport, Ky.

BILLETS—Re-rolling
 Alan Wood Steel Co., Conshohocken, Pa.
 Andrews Steel Co., The, Newport, Ky.

BILLETS—Steel
 Bethlehem (Pa.) Steel Company.
 Continental Steel Corp., Kokomo, Ind.
 Tennessee Coal, Iron & Railroad Co. (U. S. Steel Corp. Subsidiary), Birmingham, Ala.

BIMETAL—Thermostatic
 Chace, W. M., Co., 1605 Beard Ave., Detroit.

BINGS—Rotating
 Frick-Gallagher Mfg. Co., The, Wellston, Ohio.

BLANKS—Chisel
 Cleveland Steel Tool Co., The, 640 E. 82nd St., Cleveland, Ohio.

BLANKS—Gear and Pinion
 Chicago (Ill.) Rawhide Mfg. Co., The, 1304 Eiston Ave.
 Richardson Co., The, Melrose Park, Ill.

BLANKS—Gear, Silent Steel
 Waldron, John, Corp., New Brunswick, N. J.

BLAST CLEANING EQUIPMENT
 American Foundry Equipment Co., The, 401 Byrkit St., Mishawaka, Ind.
 Pangborn Corporation, Hagerstown, Md.

BLAST FURNACES
 Brassett, H. A. & Co., Chicago, Ill.

BLAST GATES
 Rockwell, W. S. Co., 50 Church St., N. Y. C.

BLOCKS—Chain
 Yale & Towne Mfg. Co., The, Phila. Div., Phila., Pa.

BLOWERS
 American Blower Corp., 6000 Russell St., Detroit.
 Bendix Products Corp., 413 Bendix Drive, South Bend, Ind.
 Clarage Fan Co., Kalamazoo, Mich.
 North American Mfg. Co., The, Cleveland.
 Spencer Turbine Co., Hartford, Conn.

BLOWPIPES—Oxy-Acetylene Welding & Cutting
 Linde Air Prods. Co., The, 30 E. 42nd St., N. Y. C.
 Weldit Acetylene Co., Detroit.

BLOWPIPES—Soldering, Heating, Annealing
 American Gas Furnace Co., Elizabeth, N. J.
 Torit Mfg. Co., St. Paul, Minn.
 Weldit Acetylene Co., Detroit.

BOILERS
 Munroe H. & Sons Mfg. Corp., Pittsburgh.

BOILERS—Waste Heat
 Babcock & Wilcox Co., The, 85 Liberty St., New York City.

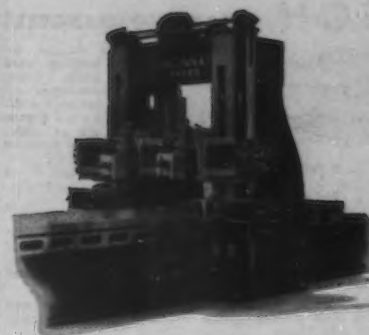
BOILERS—Water Tube
 Babcock & Wilcox Co., The, 85 Liberty St., New York City.

BOLT CUTTERS
 Landis Mch. Co., Inc., Waynesboro, Pa.

BOLT AND NUT MACHINERY
 Landis Machine Co., Inc., Waynesboro, Pa.
 Manville, E. J., Mch. Co., Waterbury, Ct.
 Waterbury (Ct.) Farrel Fdry. & Mch. Co., The.

BOLT & RIVET CLIPPERS
 Bremil Mfg. Co., Erie, Pa.
 Helwig Mfg. Co., St. Paul, Minn.

BOLTS—Carriage and Machine
 Cleveland (Ohio) Cap Screw Co., The.
 Erie (Pa.) Bolt & Nut Co.
 Lamson & Sessions Co., The, Cleveland.
 Oliver Iron & Steel Corp., Pittsburgh.
 Republic Steel Corp., Upon Nut Div., Cleveland, O.
 Russell, Burdall & Ward Bolt & Nut Co., Port Chester, N. Y.



PLANERS
 Double Housing
 Openside
CRANK PLANERS
PLANNER TYPE MILLERS
VERTICAL BORING MILLS

THE CINCINNATI PLANNER CO.
 CINCINNATI, OHIO

ROGERS
34" VERTICAL BORING MILLS
Efficiency at Low Investment
ROGERS MACHINE WORKS
 ALFRED, N. Y.

LUCAS "PRECISION"
 Horizontal Boring, Drilling and Milling Machine
THE LUCAS MACHINE TOOL CO.
 CLEVELAND, OHIO, U.S.A.

TAYLOR NEWBOLD
 INSERTED TOOL
 GOLD S

ONLY the cutting speed of machine and nature of material worked, limit the producing powers of these saws. Specially treated high speed steel teeth are inserted into a practically indestructible body. Sizes 10 to 60 inches in diameter. Write for prices and catalog.

The Tabor Mfg. Co.
 Philadelphia, Pa.

Cutting Off Machines for Saving All Kinds of Metals
THE ESPEN-LUCAS MACHINE WORKS
 FRONT AND GIRARD AVE., PHILADELPHIA, PENNA.

Grinding Polishing Sanding Drilling Reaming

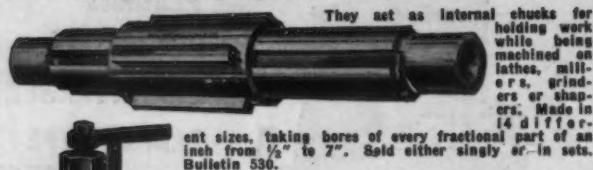
Strand

Nut Setting
 Screw Driving
 Rotary Filing
 Stainless Steel
 Weld Finishing

Flexible Shafts and Machines
 Vertical and Horizontal Types— $\frac{1}{2}$ to 2 H. P.
 Send for General Catalog

N. A. STRAND & CO.
 5001 No. Lincoln St. Chicago

NICHOLSON EXPANDING MANDRELS



They act as internal chucks for holding work while being machined on lathes, millers, grinders or shapers. Made in 14 different sizes, taking holes of every fractional part of an inch from $\frac{1}{2}$ " to 7". Sold either singly or in sets. Bulletin 530.

CONTROL VALVES in 2, 3 and 4 Way Types for operating single and double acting air, steam, water or oil cylinders, made in Lever, Foot, Solenoid and Motor Styles, for pressures up to 300 lbs. Hydraulic Valves lever operated up to 5000 lbs.

Other products—Arbor Press, Flexible Couplings, Steel and Stainless Steel Ball Fittings, Steam Traps, Steam Separators, High Pressure Air Vents.

W. H. NICHOLSON & CO.

165 OREGON ST., WILKES-BARRE, PA.

Famous for quality of threads they produce, long life of chasers and all-around dependability.

Following literature available:
Bulletin on H & G General Purpose Die Heads.
Bulletin on new Insert Chaser Type of Die Heads.
Bulletin on H & G Threading Machines.

The Eastern Machine Screw Corp.
21-41 Barclay Street, New Haven, Conn.
Los Angeles: A. C. Behringer, 312-316 Commercial St., Los Angeles, Cal.
San Francisco: A. H. Coates Company, 1142 Howard St., San Francisco, Cal.

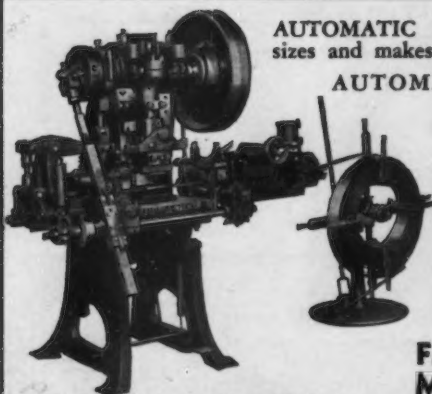


Die Heads

THE CLEVELAND CO.

Punches, Dies, Chisels, Rivet Sets
660 E. 82nd St. Cleveland, O.

If it's RIVETED you KNOW it's safe



Punch Press Equipped with a Littell No. 3 Rack and Pinion Roll Feed, Straightener, Oilier, Scrap Cutter, and No. 3 Reel.

AUTOMATIC FEEDS for all sizes and makes of punch presses.

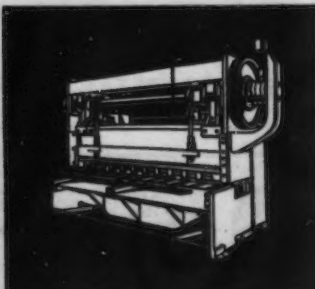
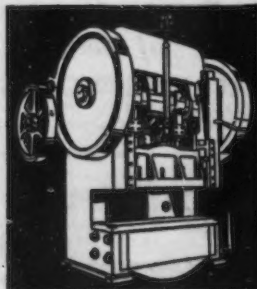
AUTOMATIC CENTERING REELS for the unreeling of coiled stock.

PUNCH PRESS AIR VALVES and UNIVERSAL AIR NOZZLES for the safe and quick ejection of work pieces.

F. J. LITTELL MACHINE CO.

4127 Ravenswood Ave. CHICAGO

CHICAGO STEEL BRAKES—PRESSES—SHEARS



DREIS & KRUMP MFG. CO.

7436 LOOMIS BLVD.

CHICAGO, ILL.

Products Index

BOLTS—Special
Erie (Pa.) Bolt & Nut Co.
Oliver Iron & Steel Corp., Pittsburgh.
Republic Steel Corp., Upson Nut Div., Cleveland, O.
Russell, Burdall & Ward Bolt & Nut Co., Port Chester, N. Y.

BOLTS—Special, Hot or Cold Upset
Lamson & Sessions Co., The, Cleveland.
Oliver Iron & Steel Corp., Pittsburgh.

BOLTS—Stove
Blake & Johnson Co., The, Waterville, Ct.
Lamson & Sessions Co., The, Cleveland.

BOLTS—Track
Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.
Republic Steel Corp., Upson Nut Div., Cleveland, O.

BOLTS AND NUTS
Ames, W. & Co., Jersey City, N. J.
Clark Bros. Bolt Co., Milldale, Conn.
Erie (Pa.) Bolt & Nut Co.
Heiz & Heiz, Inc., 33-34th St., Brooklyn, N. Y.
Oliver Iron & Steel Corp., Pittsburgh.
Republic Steel Corp., Cleveland, Ohio.
Russell, Burdall & Ward Bolt & Nut Co., Port Chester, N. Y.

BOND—Grinding Wheel
Bakelite Corp., 247 Park Ave., N. Y. C.

BOOTH—Spray
DeVilbiss Co., The, Toledo, Ohio.

BORING BARS
Bullard Co., The, Bridgeport, Conn.

BORING, DRILLING & MILLING MACHINES—Horizontal
Hill-Clarke Mchry. Co., 647 W. Washington Blvd., Chicago.
Lucas Machine Tool Co., Cleveland.
National Automatic Tool Co., Richmond, Ind.

BORING & DRILLING MACHINES—Vertical
Baker Bros., Inc., Toledo, Ohio.
Bullard Co., The, Bridgeport, Conn.

BORING MACHINES—Diamond
Ex-Cell-O Corp., 1200 Oakman Blvd., Detroit.

BORING MACHINES—Diamond & Carbide Tools
Heald Mch. Co., Worcester, Mass.

BORING MACHINES—Jig
Pratt & Whitney Div. Niles-Bement-Pond Co., Hartford, Conn.

BORING & TURNING MILLS—Vertical
Bullard Co., The, Bridgeport, Conn.
Cincinnati (Ohio) Planer Co.
Rogers Machine Wks., Alfred, New York.

BOX STRAPPING
Acme Steel Co., Chicago, Ill.

BRAKE LINING AND BLOCKS—Asbestos
Manhattan Rubber Mfg. Div. of Raybestos-Manhattan, Inc., The, 2 Townsend St., Passaic, N. J.

BRAKES—Electric
Cutler-Hammer, Inc., Milwaukee.

BRAKES—Electric & Mechanical
Clark Controller Co., The, Cleveland.
Electric Controller & Mfg. Co., The, Cleveland.

BRAKES—Magnetic
Stearns Magnetic Mfg. Co., 635 So. 28th St., Milwaukee.

BRAKES—Metal Forming
Cincinnati (Ohio) Shaper Co., The.
Dreis & Krump Mfg. Co., Chicago.
Schatz Mfg. Co., The, Poughkeepsie, N. Y.
Steelweld Machinery Co., Cleveland.

BRICK—Fire Clay
Carborundum Co., The, Niagara Falls, N. Y.
Illinois Clay Products Co., Joliet, Ill.
Quigley Co., Inc., 56 West 45th St., N. Y. C.

BRICK—Insulating
Babcock & Wilcox Co., The, 85 Liberty St., New York City.

BRIDGE BUILDERS
American Bridge Co. (U. S. Steel Corp. Subsidiary), Pittsburgh.
Belmont Iron Works, Philadelphia.

BRIDGE OPERATING MACHINERY—Movable
Earle Gear & Mch. Co., Philadelphia.

BRIQUETS—Ferroalloy
Electro Metallurgical Sales Corp., 30 East 42nd St., N. Y. C.

BROACHING MACHINES
Bullard Co., The, Bridgeport, Conn.
Cincinnati (Ohio) Milling Mch. Co., The.
Oilgear Co., The, 1311 W. Bruce St., Milwaukee.

BRONZE FOR DIES
Ampco Metal, Inc., Milwaukee, Wis.

BRONZE—Phosphor
Bunting Brass & Bronze Co., Toledo, Ohio.
Phosphor Bronze Smelting Co., The, Phila.
Revere Copper & Brass, Inc., 230 Park Ave., N. Y. C.
Riverside (N. J.) Metal Co.
Seymour (Conn.) Mfg. Co.

BRUSHES—Machine
Pittsburgh Plate Glass Co., Brush Div., Baltimore, Md.

BRUSHES—Wire
Pittsburgh Plate Glass Co., Brush Div., Baltimore, Md.

BUCKETS—Clamshell
Blaw-Knox Co., Pittsburgh.
Hayward Co., The, 50 Church St., N. Y. C.
Industrial Brownhoist Corp., Bay City, Mich.

BUCKETS—Electric Motor
Hayward Co., The, 50 Church St., N. Y. C.

BUCKETS—Elevator
Jeffrey Mfg. Co., The, Columbus, Ohio.

BUCKETS—Orange Peel
Hayward Co., The, 50 Church St., N. Y. C.

BUFFERS & POLISHING MACHINES
Packer Machine Co., The, Meriden, Conn.
Vonnegut Moulder Corp., 1807 Madison Ave., Indianapolis, Ind.

BUFFING APPLICATORS—Automatic
Packer Machine Co., The, Meriden, Conn.

BUILDINGS—Factory
Ferguson, H. K., Co., The, Cleveland.

BUILDINGS—Steel
American Bridge Co. (U. S. Steel Corp. Subsidiary), Pittsburgh.
Belmont Iron Works, Philadelphia.
Bethlehem (Pa.) Steel Co.
Blaw-Knox Co., Pittsburgh.

BULLDOZERS
Beatty Mch. & Mfg. Co., 936-150th St., Hammond, Ind.

BULLDOZERS—Hydraulic
Elmes, Chas. F., Engng. Wks., Chicago.

BURNERS—Oil or Gas
North American Mfg. Co., The, Cleveland.

BUSHINGS—Bronze
Ampco Metal, Inc., Milwaukee, Wis.
Bunting Brass & Bronze Co., Toledo, O.
Johnson Bronze Co., 505 So. Mill St., New Castle, Pa.

BUSHINGS—Oilless
Rhoades, R. W., Metaline Co., Inc., Long Island City, N. Y.

BUSHINGS—Phosphor Bronze
Bunting Brass & Bronze Co., Toledo, Ohio.
Phosphor Bronze Smelting Co., The, Phila.

BY-PRODUCTS COKE AND GAS OVENS
Koppers Co., Pittsburgh.

CABINETS—Stock
Fleck-Gallagher Mfg. Co., The, Wellston, Ohio.

CABLE—Electric
General Electric Co., Schenectady, N. Y.
Lincoln Electric Co., The, Cleveland.
Simplex Wire & Cable Co., Cambridge A., Boston, Mass.

CABLEWAYS AND TRAMWAYS—See Tramways

CADMIUM
Du Pont de Nemours, E. I., & Co., Inc., Grasselli Chemicals Dept., Wilmington, Del.

CADMIUM PLATING PROCESS
Du Pont de Nemours, E. I., & Co., Inc., Grasselli Chemicals Dept., Wilmington, Del.

CALCIUM METAL & ALLOYS
Electro Metallurgical Sales Corp., 30 East 42nd St., N. Y. C.

CALCULATING MACHINES
Monroe Calculating Machine Co., Inc., Orange, N. J.

CARBIC
Linde Air Prods. Co., The, 30 East 42nd St., N. Y. C.

CARBIDE
Air Reduction Sales Co., 60 East 42nd St., N. Y. C.
Linde Air Prods. Co., The, 30 East 42nd St., N. Y. C.

CARBIDE—Boron
Norton Co., Worcester, Mass.

CARBURIZING—See Heat Treating

CARS—Industrial and Mining
Atlas Car & Mfg. Co., The, Cleveland.
Bartlett, C. O.-Snow Co., The, Cleveland.

CASE HARDENING—See Heat Treating

CASTINGS—Acid or Heat Resisting
Ampco Metal, Inc., Milwaukee, Wis.
Duron Co., Inc., The, 433 N. Findlay St., Dayton, Ohio.

CASTINGS—Alloy Steel
Hoskins Mfg. Co., Detroit, Mich.
Lebanon (Pa.) Steel Foundry.

CASTINGS—Alloy Steel
Midvale Co., The, Nicetown, Phila., Pa.
Meehanite Metal Corp., Pittsburgh.

CASTINGS—Alloy Steel
Forging & Casting Corp., The, Ferndale, Mich.

CASTINGS—Alloy Steel
Weatherly (Pa.) Foundry & Mfrs. Co.

CASTINGS—Alloy Steel
Rivett Steel Co., The, Cleveland.
Dodge Steel Co., Philadelphia, Pa.
Lebanon (Pa.) Steel Foundry.
Mackintosh-Hemphill Co., Pittsburgh.

CASTINGS—Alloy Steel
Midvale Co., The, Nicetown, Phila., Pa.

Products Index

CASTINGS—Aluminum

Aluminum Co. of America, Pittsburgh.

CASTINGS—Brass, Bronze, Copper or Aluminum

Cadman, A. W., Mfg. Co., Pittsburgh.
Carbon Malleable Casting Co., Inc., Lancaster, Pa.
Lawrenceville Bronze Co., Pittsburgh.
National Bearing Metals Corp., Pittsburgh.
Phosphor Bronze Smelting Co., The, Phila.
Snyder, W. P., & Co., Pittsburgh.
Spencer's, I. S., Sons, Inc., Guilford, Ct.

CASTINGS—Corrosion Resisting

Meehanite Metal Corp., Pittsburgh.
Midvale Co., The, Nicetown, Phila., Pa.

CASTINGS—Die, Aluminum

Aluminum Co. of America, Pittsburgh.

CASTINGS—Electric Steel

Dodge Steel Co., Philadelphia, Pa.
Industrial Steel Casting Co., The, Toledo, Lebanon (Pa.) Steel Foundry.

CASTINGS—Gray Iron

American Engineering Co., Philadelphia.
Cheney, S., & Son, Manlius, N. Y.
Midvale Co., The, Nicetown, Phila., Pa.
Murray Iron Wks. Co., Burlington, Iowa.
National Roll & Fdry. Co., Avonmore, Pa.
North Wales (Pa.) Mach. Co., Inc.
Spencer's, I. S., Sons, Inc., Guilford, Ct.

CASTINGS—High Test & Alloy Iron

Meehanite Metal Corp., Pittsburgh.

CASTINGS—Magnesium Alloys

Dow Chemical Co., The, 921 Jefferson Ave., Midland, Mich.

CASTINGS—Malleable

Baltimore (Md.) Malleable Iron & Steel Casting Co.
Carbon Malleable Casting Co., Inc., Lancaster, Pa.
Lake City Malleable Co., The, 5100 Lakeside Ave., Cleveland.
Malleable Iron Fittings Co., Branford, Ct.
Peoria (Ill.) Malleable Castings Co.

CASTINGS—Meehanite Metal

Meehanite Metal Corp., Pittsburgh.

CASTINGS—Monel & Nickel

Superior Bronze Corp., Erie, Pa.

CASTINGS—Semi-Steel

Malleable Iron Fittings Co., Branford, Ct.

CASTINGS—Steel

Bethlehem (Pa.) Steel Company.
Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.
Columbia Steel Co. (U. S. Steel Corp. Subsidiary), San Francisco, Calif.
Crucible Steel Castings Co., Lansdowne, Pa.
Dodge Steel Co., Philadelphia, Pa.
Industrial Steel Castings Co., The, Toledo, Lebanon (Pa.) Steel Foundry.
Mackintosh-Hemphill Co., Pittsburgh.
Malleable Iron Fittings Co., Branford, Ct.
Mesta Mch. Co., Pittsburgh.
Midvale Co., The, Nicetown, Phila., Pa.
Standard Steel Wks. Co., Burnham, Pa.

CASTINGS—Wear Resisting

Meehanite Metal Corp., Pittsburgh.

CEMENT—Acid-Proof

Atlas Mineral Products Co. of Pa., The, Merktown, Pa.
Pennsylvania Salt Mfg. Co., Philadelphia, Pa.

CEMENT—Quick Setting, Acid Proof & Insulator

Nukem Products Corp., 68 Niagara St., Buffalo, N. Y.

CEMENT—Refractory

Carborundum Co., The, Perth Amboy, N. J.
Johns-Manville Corp., 22 East 40th St., New York City.
Quigley Co., Inc., 56 West 45th St., N. Y. C.

CEMENT—Rubber

Goodrich, B. F., Co., The, Akron, Ohio.

CHAINS—Conveyor & Elevator

Baldwin-Duckworth Chain Corp., Springfield, Mass.
Bartlett, C. O., Snow Co., The, Cleveland.
Diamond Chain & Mfg. Co., Indianapolis, Ind.
Jeffrey Mfg. Co., The, Columbus, Ohio.

CHAINS—Power Transmission

Baldwin-Duckworth Chain Corp., Springfield, Mass.
Boston Gear Works, Inc., North Quincy, Mass.
Diamond Chain & Mfg. Co., Indianapolis, Ind.
Jeffrey Mfg. Co., The, Columbus, Ohio.
Link-Belt Co., Chicago.
Morse Chain Co., Ithaca, New York.
Whitney Chain & Mfg. Co., Hartford, Ct.

CHAINS—Roller

Baldwin-Duckworth Chain Corp., Springfield, Mass.
Bartlett, C. O., Snow Co., The, Cleveland.
Diamond Chain & Mfg. Co., Indianapolis, Ind.
Link-Belt Co., Chicago.
Morse Chain Co., Ithaca, New York.
Whitney Chain & Mfg. Co., Hartford, Ct.

CHAINS—Silent

Link-Belt Co., Chicago.
Morse Chain Co., Ithaca, New York.
Whitney Chain & Mfg. Co., Hartford, Ct.

CHANNELS—See Angles, Beams, Channels and Tees

CHECKS—Metal

Cunningham, M. E., Co., Pittsburgh.
Noble & Westbrook Mfg. Co., The, East Hartford, Ct.

CHEMICALS—Industrial

Du Pont de Nemours, E. I., & Co., Inc., Grasseville Chemicals Dept., Wilmington, Del.
Pennsylvania Salt Mfg. Co., Philadelphia, Pa.

CHEMICALS—Rust Proofing

Parker Rust-Proof Co., 2186 Milwaukee Ave., Detroit.
Udylite Co., The, Detroit.

CHROMIUM METAL & ALLOYS

Electro Metallurgical Sales Corp., 30 East 42nd St., N. Y. C.

CHUCKING MACHINES—Automatic

New Britain-Gridley Machine Div., The New Britain Machine Co., New Britain, Conn.

CHUCKING MACHINES—Multiple Spindle

Baird Mch. Co., The, Bridgeport, Conn.
Goss & DeLeeuw Machine Co., New Britain, Conn.
National Acme Co., The, Cleveland.

CHUCKS—Air Operated

Hannifin Mfg. Co., Chicago.

CHUCKS—Drill

Cleveland (Ohio) Twist Drill Co., The.
Morse Twist Drill & Mach. Co., New Bedford, Mass.

CHUCKS—Magnetic

Head Mch. Co., Worcester, Mass.
Tait-Peirce Mfg. Co., The, Woonsocket, R.I.

CIRCLES—Phosphor Bronze

Phosphor Bronze Smelting Co., The, Phila.
Revere Copper & Brass, Inc., 230 Park Ave., N. Y. C.
Riverside (N. J.) Metal Co.

CLEANERS—Metal

American Chemical Paint Co., Ambler, Pa.
Detroit Rex Products Co., Detroit, Mich.
Ford, J. B., Co., The, Wyandotte, Mich.
Nukem Products Corp., 68 Niagara St., Buffalo, N. Y.

CLEANING COMPOUNDS—Alkali

Detroit Rex Products Co., Detroit, Mich.
Pennsylvania Salt Mfg. Co., Philadelphia, Pa.

CLEANING EQUIPMENT—Metal

Detroit Rex Products Co., Detroit, Mich.

CLEANING EQUIPMENT (Metal)—Electro-Chemical

Bullard Co., The, Bridgeport, Conn.

CLEANING MATERIALS—Glass

Nukem Products Corp., 68 Niagara St., Buffalo, N. Y.

CLUTCH-BRAKES—Magnetic

Stearns Magnetic Mfg. Co., 635 So. 28th St., Milwaukee.

CLUTCHES

Fairbanks, Morse & Co., Chicago.
Falls Clutch & Mchry. Co., The, Cuyahoga Falls, Ohio.
Jones, W. A., Fdry. & Mch. Co., 4401 Roosevelt Rd., Chicago.
Medart Co., The, St. Louis, Mo.
Morse Chain Co., Ithaca, New York.

CLUTCHES—Magnetic

Cutler-Hammer, Inc., Milwaukee.
Dings Magnetic Separator Co., Milwaukee.
Stearns Magnetic Mfg. Co., 635 So. 28th St., Milwaukee.

CLUTCHES—Overrunning

Morse Chain Co., Ithaca, New York.

COAL

Cleveland-Cliffs Iron Co., The, Cleveland, Ohio.

Hanna Furnace Corp., The, Detroit, Mich.

Koppers Coal Co., Inc., The, Pittsburgh.

Pickands Mather & Co., Cleveland.

COAL ORE AND ASH HANDLING MACHINERY

Bartlett, C. O., Snow Co., The, Cleveland.
Jeffrey Mfg. Co., The, Columbus, Ohio.
Robins Conveying Belt Co., 15 Park Row, N. Y. C.

COBALT METAL

Central Trading Corp., 511 Fifth Ave., N. Y. C.

COILS—Pipe

Harrisburg (Pa.) Steel Corp.

COKE—Metallurgical

Cleveland-Cliffs Iron Co., The, Cleveland, Ohio.

Pickands Mather & Co., Cleveland.

COKE OVEN MACHINERY

Atlas Car & Mfg. Co., The, Cleveland.

Koppers Co., Pittsburgh.

COKE OVENS—By-Products

Koppers Co., Pittsburgh.

COKE OVENS—Cross Regenerators

Koppers Co., Pittsburgh.

COKE OVENS—With Recovery of By-Products

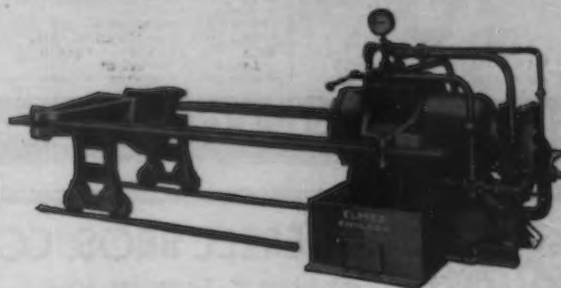
Koppers Co., Pittsburgh.

COLLETS

Bivett Lathe & Grinder, Inc., Boston, Mass.

HYDRAULIC MACHINERY
ELMES
CHICAGO

FORCING PRESS LINE —NEW MODELS—



High and Low Pressure Rotary Pumping Units;
Double Acting Cylinders . . . Rapid Advance and
Return . . . Adjustable Clearance between bars;
Opening between Ram and Resistance Head to suit.

OUR LINE AFFORDS CHOICE OF DESIGN
BUILT FOR USE IN EVERY INDUSTRY . . .

CHARLES F. ELMES ENGINEERING WORKS
1003 Fulton St., Chicago, Ill.

DIEHEADS
SELF OPENING

TAPS
COLLAPSIBLE

THREADING MACHINES
THE MURCHEY MACHINE & TOOL CO.
951 PORTER ST. DETROIT, MICH.

THE MARK **"DARWIN"** OF QUALITY
PIONEERS OF MODERN QUANTITY PRODUCTION
ALLOY-TOOL-STEELS
DARWIN & MILNER, INC. 1260 W. 4TH ST. CLEVELAND, O.

MANGANO NON SHRINKABLE
DIE STEEL
ALSO HIGH SPEED & STAINLESS TOOL STEELS
LATROBE ELECTRIC STEEL CO.
LATROBE PA.

STANLEY STEEL
STEEL MAKERS SINCE 1871
BILLETS - SLABS - STRIP STEEL
THE STANLEY WORKS
NEW BRITAIN, CONN. - BRIDGEPORT, CONN. - HAMILTON, ONTARIO

GRIFFIN

**COLD ROLLED
STRIP
STEEL**

1/2" to 19" wide.

.002" to .500" thick
Desired Quality for
Forming and Drawing

GRIFFIN MFG. CO. ERIE, PENNA.

SALES AGENTS

NEW YORK CITY—Wm. H. Leonori & Co., Inc., 30 Howard St.
PHILADELPHIA—C. B. Tippet, 4308 North Broad St.
CHICAGO—Central Steel & Wire Co., 4545 South Western Blvd.
DETROIT—E. B. Wegener, 514 Stephenson Bldg.
CLEVELAND—Paterson-Leitch Co., 900 East 69th St.
BUFFALO—J. J. Lambert, 323 Huntington Ave.
DAYTON—Central Steel & Wire Co., 1093 East Monument Ave.
SAN FRANCISCO—Charles L. Lewis, 703 Market St.



WETHERELL BROS. CO.

251 Albany St., Cambridge, Mass.

**C. R. Strip
Tool Steel**

**Stainless Steel
O H Specialties**

POOR AND COMPANY

Any **FORGINGS** Any
Size Specification

CANTON FORGE & AXLE WORKS
2025 DUEBER AVE., S. W., CANTON, OHIO

STEEL FORGINGS

UPSET, DROP and COIN PRESSED
ANY ANALYSIS—ANY QUANTITY

Send us your blue prints for prices

ROCKFORD DROP FORGE CO.

2030 9th St.
ROCKFORD, ILL.

HOLLOW BORED SPINDLES

Machine tools must have good spindles. That is why leading machine tool builders use American Hollow Bored products. Write for prices on American Hollow Bored spindles, shafts, rams and hydraulic cylinders.

AMERICAN HOLLOW BORING CO.
1912 RASPBERRY ST. ERIE, PA.



ATLAS
DROP FORGINGS
2 ounces to 500 pounds

ATLAS DROP FORGE CO., LANSING, MICHIGAN

Products Index

COLUMBIUM

Electro Metallurgical Sales Corp., 30 E. 42nd St., N. Y. C.

COMBUSTION CONTROLS

Leeds & Northrup Co., Philadelphia.
Morgan Construction Co., Worcester, Mass.
North American Mfg. Co., The, Cleveland.

COMPOUNDS—Drawing

Gulf Oil Corp., Gulf Refining Co., Pittsburgh.
Socony-Vacuum Oil Co., Inc., 26 Broadway, N. Y. C.
Standard Oil Co. (Indiana), Chicago.
Tide Water Associated Oil Co., 17 Battery Place, N. Y. C.

COMPRESSORS—Air

Curtis Pneumatic Machinery Co., 1948 Kienlen Ave., St. Louis, Mo.
Fairbanks, Morse & Co., Chicago.
Hobart Bros., Troy, Ohio.
Ingersoll-Rand Co., 11 Broadway, New York City.
Pennsylvania Pump & Compressor Co., Easton, Pa.
Spencer Turbine Co., Hartford, Conn.
Sullivan Machinery Co., Michigan City, Ind.
Westinghouse Air Brake Co., Industrial Div., Pittsburgh.
Worthington Pump & Machinery Corp., Harrison, N. J.

COMPRESSORS—Gas

Sullivan Machinery Co., Michigan City, Ind.
Worthington Pump & Machinery Corp., Harrison, N. J.

COMPRESSORS—Rebuilt. (See Clearing House Section)

CONCRETE CONSTRUCTION

Ferguson, H. K., Co., The, Cleveland.

CONDENSERS—Surface & Jet

Ingersoll-Rand Co., 11 Broadway, N.Y.C.
Pennsylvania Pump & Compressor Co., Easton, Pa.
Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.
Worthington Pump & Machinery Corp., Harrison, N. J.

CONTRACTORS' SUPPLIES—Second-Hand. (See Clearing House Section)

CONTROL SYSTEMS—Temperature

Leeds & Northrup Co., Philadelphia.

CONTROLLERS—Crane

Cutler-Hammer, Inc., Milwaukee.

CONTROLLERS—Electric

Clark Controller Co., The, Cleveland.
Cutler-Hammer, Inc., Milwaukee.
Electric Controller & Mfg. Co., The, Cleveland.
General Electric Co., Schenectady, N. Y.

CONTROLLERS—Valve, Electrically Operated

Cutler-Hammer, Inc., Milwaukee.
Leeds & Northrup Co., Philadelphia.

CONVEYING AND ELEVATING MACHINERY

Bartlett, C. O.-Snow Co., The, Cleveland.
Jeffrey Mfg. Co., The, Columbus, Ohio.
Link-Belt Co., Chicago.
Logan Co., Inc., Louisville, Ky.
Mathews Conveyor Co., Ellwood City, Pa.
Robbins Conveying Belt Co., 15 Park Row, N. Y. C.

CONVEYOR WORMS

Lee Spring Co., Inc., 30 Main St., Brooklyn, N. Y.

CONVEYORS—Flexible Wire Belt

Audubon Wire Cloth Corp., Phila., Pa.

CONVEYORS—Gravity

Logan Co., Inc., Louisville, Ky.
Mathews Conveyor Co., Ellwood City, Pa.

CONVEYORS—Monorail

American Monorail Co., The, Cleveland.
Cleveland Tramrail Div. of The Cleveland Crane & Engng. Co., Wickliffe, Ohio.

CONVEYORS—Portable

Jeffrey Mfg. Co., The, Columbus, Ohio.
Robbins Conveying Belt Co., 15 Park Row, N. Y. C.

COPING MACHINES

Schatz Mfg. Co., The, Poughkeepsie, N. Y.

CORE OIL

Socony-Vacuum Oil Co., Inc., 26 Broadway, N. Y. C.
Sun Oil Co., Philadelphia.
Tide Water Associated Oil Co., 17 Battery Place, N. Y. C.

CORUNDUM WHEELS—See Grinding Wheels

COTTERS AND KEYS—Spring

Hindley Mfg. Co., Valley Falls, R. I.
Hubbard, M. D., Spring Co., 750 Central Ave., Pontiac, Mich.
Western Wire Prods. Co., St. Louis, Mo.

COUNTERBORES

Cleveland (Ohio) Twist Drill Co., The.
Morse Twist Drill & Mch. Co., New Bedford, Mass.

COUNTERS—Production

Durant Mfg. Co., Milwaukee, Wis.
Veeder-Root, Inc., Hartford, Ct.

COUNTERS—Revolution, Recording

Durant Mfg. Co., Milwaukee, Wis.

COUNTING MACHINES

Veeder-Root, Inc., Hartford, Conn.

COUPLINGS—Air Hose

Cleveland (Ohio) Pneumatic Tool Co., The.

COUPLINGS—Cut-off Friction

Jones, W. A., Fdry. & Mch. Co., 4401 Roosevelt Rd., Chicago.

COUPLINGS—Flexible

Diamond Chain & Mfg. Co., Indianapolis, Ind.
Lovejoy Flexible Coupling Co., Chicago.
Morse Chain Co., Ithaca, New York.
Waldron, John, Corp., New Brunswick, N. J.

COUPLINGS—Pipe

Harrisburg (Pa.) Steel Corp.
National Tube Co. (U. S. Steel Corp. Subsidiary), Pittsburgh.

CRANES—Crawling Tractor

Harnischfeger Corp., 4401 W. National Ave., Milwaukee.
Industrial Brownhoist Corp., Bay City, Mich.
Ohio Locomotive Crane Co., The, Bucyrus, Ohio.

CRANES—Electric, Industrial, Truck Mounted

Baker-Raulang Co., The, 2175 W. 25th St., Cleveland.
Elwell-Parker Electric Co., The, Cleveland.

CRANES—Electric Traveling

Armstrong, James P., Pittsburgh.
Cleveland Crane & Engineering Co., Wickliffe, Ohio.

CONCO ENGINEERING WORKS, MENDOTA, ILL.

Curtis Pneumatic Machinery Co., 1948 Kienlen Ave., St. Louis, Mo.
Electric Hoist & Motor Co., 149 N. 9th St., Bklyn., N. Y.
Euclid Crane & Hoist Co., The, Euclid, O.
Harnischfeger Corp., 4401 W. National Ave., Milwaukee.
Morgan Engineering Co., The, Alliance, O.
Northern Engineering Works, Detroit, Mich.
Robbins & Myers, Inc., Springfield, Ohio.
Shaw-Box Crane & Hoist Co., Inc., 402 Broadway, Muskegon, Mich.
Shepard Niles Crane & Hoist Corp., Montour Falls, N. Y.
Whiting Corp., Harvey, Ill.

CRANES—Gantry

Cleveland Crane & Engineering Co., Wickliffe, Ohio.
Harnischfeger Corp., 4401 W. National Ave., Milwaukee.
Morgan Engineering Co., The, Alliance, O.
Whiting Corp., Harvey, Ill.

CRANES—Hand Power

American Monorail Co., The, Cleveland.
Cleveland Crane & Engineering Co., Wickliffe, Ohio.
Cleveland Tramrail Div. of The Cleveland Crane & Engng. Co., Wickliffe, Ohio.

CONCO ENGINEERING WORKS, MENDOTA, ILL.

Curtis Pneumatic Machinery Co., 1948 Kienlen Ave., St. Louis, Mo.
Euclid Crane & Hoist Co., The, Euclid, O.
Harnischfeger Corp., 4401 W. National Ave., Milwaukee.
Industrial Brownhoist Corp., Bay City, Mich.
Northern Engineering Works, Detroit.
Shaw-Box Crane & Hoist Co., Inc., 402 Broadway, Muskegon, Mich.

CRANES—Jib

American Monorail Co., The, Cleveland.
Cleveland Tramrail Div. of The Cleveland Crane & Engng. Co., Wickliffe, Ohio.
Conco Engineering Works, Mendota, Ill.
Euclid Crane & Hoist Co., The, Euclid, O.
Shaw-Box Crane & Hoist Co., Inc., 402 Broadway, Muskegon, Mich.
Whiting Corp., Harvey, Ill.

CRANES—Locomotive

Harnischfeger Corp., 4401 W. National Ave., Milwaukee.
Industrial Brownhoist Corp., Bay City, Mich.
Ohio Locomotive Crane Co., The, Bucyrus, O.

CRANES—Monorail

American Monorail Co., The, Cleveland.
Cleveland Tramrail Div. of The Cleveland Crane & Engng. Co., Wickliffe, Ohio.
Euclid Crane & Hoist Co., The, Euclid, O.
Northern Engineering Works, Detroit.
Shaw-Box Crane & Hoist Co., Inc., 402 Broadway, Muskegon, Mich.
Shepard Niles Crane & Hoist Corp., Montour Falls, N. Y.

CRANES—Portable

Canton Fdry. & Mch. Co., Cleveland.

CRANES—Portable Electric

Baker-Raulang Co., The, 2175 W. 25th St., Cleveland.
Elwell-Parker Electric Co., The, Cleveland.

CRANKSHAFTS

Union Drawn Steel Co., Massillon, Ohio.

CRUSHERS—Coal

American Pulverizer Co., 1439 Macklind Ave., St. Louis, Mo.
Jeffrey Mfg. Co., The, Columbus, Ohio.

Products Index

CRUSHERS—Steel Turning

American Pulverizer Co., 1439 Macklind Ave., St. Louis, Mo.

CUTTERS—Die Sinking

Pratt & Whitney Div. Niles-Bement-Pond Co., Hartford, Conn.
Tomkins-Johnson Co., The, Jackson, Mich.

CUTTERS—Keyseating

Davis Keyseater Co., 400 Exchange St., Rochester, N. Y.

CUTTERS—Milling

Crown & Sharpe Mfg. Co., Providence, R.I.
Cleveland (Ohio) Twist Drill Co., The.
Ex-Cell-O Corp., 1200 Oakman Blvd., Detroit.

Morse Twist Drill & Mch. Co., New Bedford, Mass.

Pratt & Whitney Div. Niles-Bement-Pond Co., Hartford, Conn.

CUTTING-OFF MACHINES—Abrasives

Tabor Mfg. Co., Phila.

CUTTING-OFF MACHINES—Cold Saw

Espen-Lucas Mch. Wks., Philadelphia.
Heller Machine Co., 114 Liberty St., N. Y. C.

CUTTING-OFF MACHINES—Pipe or

Tubing

Aetna-Standard Engineering Co., The, Youngstown, Ohio.

Bardons & Oliver, Cleveland.

Etna Machine Co., The, Toledo, Ohio.

Landis Mch. Co., Inc., Waynesboro, Pa.

CUTTING AND WELDING APPARATUS

—Oxy-Acetylene—See Welding and Cutting

Machines and Equipment—Oxy-Acetylene.

CYLINDERS—Compressed Air & Hy-

draulics

Tomkins-Johnson Co., The, Jackson, Mich.

CYLINDERS—Seamless

Harrisburg (Pa.) Steel Corp.

National Tube Co. (U. S. Steel Corp. Subsidiary), Pittsburgh.

DEGREASING COMPOUNDS

Pennsylvania Salt Mfg. Co., Philadelphia, Pa.

DEGREASING MACHINES—Solvent

Detroit Rex Products Co., Detroit, Mich.

DEOXIDIZERS

Vanadium Corp. of America, 420 Lexington Ave., N. Y. C.

DICTATING MACHINES

Dictaphone Sales Corp., 420 Lexington Ave., New York City.

DIE BLOCKS—Drop Hammer

Heppenstall Co., Pittsburgh.

DIE-FILING MACHINES

Continental Machine Specialties, Inc., Minneapolis, Minn.

DIE SINKING MACHINES—Automatic

and Hand

Cincinnati (Ohio) Milling Mch. Co., The.

Pratt & Whitney Div., Niles-Bement-Pond Co., Hartford, Conn.

DIEING MACHINES—Automatic

Henry & Wright Mfg. Co., The, Hartford, Conn.

DIES—Cast Tool Steel

Forging & Casting Corp., The, Ferndale, Mich.

DIES, JIGS, FIXTURES, etc.

Taft-Peire Mfg. Co., The, Woonsocket, R. I.

DIES—Pipe Threading

Landis Mch. Co., Inc., Waynesboro, Pa.

Murphy Machine & Tool Co., Detroit.

DIES—Screw and Thread Cutting

Eastern Mach. Screw Corp., New Haven, Ct.

Greenfield (Mass.) Tap & Die Corp.

Jones & Lamson Mch. Co., Springfield, Vt.

Landis Mch. Co., Inc., Waynesboro, Pa.

Murphy Machine & Tool Co., Detroit.

National Acme Co., The, Cleveland.

DIES—Self-Opening Adjustable

Eastern Mach. Screw Corp., New Haven, Ct.

Jones & Lamson Mch. Co., Springfield, Vt.

Landis Mch. Co., Inc., Waynesboro, Pa.

Murphy Machine & Tool Co., Detroit.

Noble & Westbrook Mfg. Co., The, East Hartford, Ct.

DOORS & SHUTTERS, Fireproof

Kinnear Mfg. Co., Columbus, Ohio.

DOORS & SHUTTERS—Steel or Wood

Refining

Kinnear Mfg. Co., Columbus, Ohio.

DRAWN WORK—Metal—See Stampings

or Drawings—Metal

DRILL HEADS—Hydraulic

National Automatic Tool Co., Richmond, Ind.

DRILL HEADS—Multiple

Baker Bros., Inc., Toledo, Ohio.

Ex-Cell-O Corp., 1200 Oakman Blvd., Detroit.

DRILLING MACHINES—Bench

Leland-Gifford Co., Worcester, Mass.

DRILLING MACHINES—Heavy Duty

Baker Bros., Inc., Toledo, Ohio.

DRILLING MACHINES—Multiple Spin-

dia

Baker Bros., Inc., Toledo, Ohio.

Henry & Wright Mfg. Co., The, Hartford, Conn.

National Automatic Tool Co., Richmond, Ind.

DRILLING MACHINES—Multiple Spin-

die Adjustable

National Automatic Tool Co., Richmond, Ind.

DRILLING MACHINES—Multiple Spin-

die Horizontal

Baker Bros., Inc., Toledo, Ohio.

National Automatic Tool Co., Richmond, Ind.

DRILLING MACHINES—Portable Electric

Wodack Electric Tool Corp., Chicago.

DRILLING MACHINES—Portable Pneumatic

Cleveland (Ohio) Pneumatic Tool Co., The.

Helwig Mfg. Co., St. Paul, Minn.

Ingersoll-Rand Co., 11 Broadway, New York City.

Warner & Swasey Co., The, Cleveland.

DRILLING MACHINES—Radial

Cincinnati (Ohio) Bickford Tool Co., The.

DRILLING MACHINES—Rock

Ingersoll-Rand Co., 11 Broadway, New York City.

DRILLING MACHINES—Sensitive

Leland-Gifford Co., Worcester, Mass.

DRILLING MACHINES—Upright

Baker Bros., Inc., Toledo, Ohio.

Cincinnati (Ohio) Bickford Tool Co., The.

Cleereman Machine Tool Co., Green Bay, Wis.

DRILLING MACHINES—Vertical

Baker Bros., Inc., Toledo, Ohio.

Cincinnati (Ohio) Bickford Tool Co., The.

Cleereman Machine Tool Co., Green Bay, Wis.

DRIVES—Gear

Farrel-Birmingham Co., Inc., Buffalo, N. Y.

Mesta Mch. Co., Pittsburgh.

DRIVES—Single & Multiple V-Belts

Allis Chalmers Mfg. Co., Milwaukee.

DROP FORGINGS—See Forgings—Drop,

Iron or Steel

DROP HAMMERS—See Hammers—Drop

DUST COLLECTORS

Abrasive Machine Tool Co., East Providence, R. I.

American Air Filter Co., Inc., Louisville, Ky.

American Blower Corp., 6000 Russell St., Detroit.

American Foundry Equipment Co., The, 401 Bykritt St., Mishawaka, Ind.

Blaw-Knox Co., Pittsburgh.

Pangborn Corporation, Hagerstown, Md.

Whiting Corp., Harvey, Ill.

ECONOMIZERS

Babcock & Wilcox Co., The, 85 Liberty St., New York City.

ELECTRIC HEATING ELEMENTS

Global Div., The Carborundum Co., Niagara Falls, N. Y.

ELECTRIC LIGHTING

General Electric Co., Cleveland.

General Electric Vapor Lamp Co., Hoboken, N. J.

ELECTRIC WELDING—See Welding—

Electric

ELECTRICAL EQUIPMENT

Allis-Chalmers Mfg. Co., Milwaukee.

General Electric Co., Schenectady, N. Y.

ELECTRICAL MACHINERY—Second

Hand. (See Clearing House Section)

ELECTRICAL WIRES

Boehling's, John A., Sons Co., Trenton, N. J.

ELECTRODE HOLDERS—Welding

Lincoln Electric Co., The, Cleveland.

ELECTRODES—Resistance Welding

Electroly Co., Inc., 50 Church St., New York City.

ELECTRODES—Welding, Coated

Electric Arc Cutting & Welding Co., The, Newark, N. J.

Harnischfeger Corp., 4401 W. National Ave., Milwaukee.

Lincoln Electric Co., The, Cleveland.

Maurath, Inc., 7400 Union Ave., Cleveland.

Una Welding, Inc., Cleveland, Ohio.

ELECTROPLATING EQUIPMENT & SUPPLIES

Udyette Co., The, Detroit.

ELEVATORS—Portable

Lewis-Shepard Co., 122 Walnut St., Watertown Station, Boston.

ELEVATORS—Steam Hydraulic

Ridgway, Craig, & Son Co., Coatesville, Pa.

EMERY WHEELS—See Grinding Wheels

ENAMEL

Roxall Flexible Lacquer Co., Inc., Elizabeth, New Jersey.

Sherwin-Williams Co., Cleveland.

ENGINEERS & CONTRACTORS

Ferguson, H. K., Co., The, Cleveland.

ENGINEERS—Consulting and Industrial

Koppers Co., Pittsburgh.

ENGINEERS—Diesel

Worthington Pump & Machinery Corp., Harrison, N. J.

DROP FORGINGS

Shape material up to 350 lbs

WILLIAMS & CO.

Forging People

CHICAGO

Drop Forgings

OF EVERY DESCRIPTION

Special Attention given Chrome, Nickel Steel,

Up-to-date Equipment for Heat Treatment.

The Canton Drop Forging & Mfg. Co.

CANTON, OHIO

District Office, Flatiron Building, New York

From a Pound to a Ton **ELECTRIC** Inquiries Solicited

STEEL CASTINGS

CRUCIBLE STEEL CASTINGS COMPANY

LANSDOWNE, DELAWARE COUNTY, PENNSYLVANIA

(Near Philadelphia)

NATIONAL BEARING METALS CORPORATION

ROLLING MILL BRONZE CASTINGS

Roll Neck Bearings Acid Resisting Castings

Locomotive Castings

BLAST FURNACE COPPER

Housing Nuts Machinery Castings

Car Journal Bearings

ALUMINUM BRONZE CASTINGS

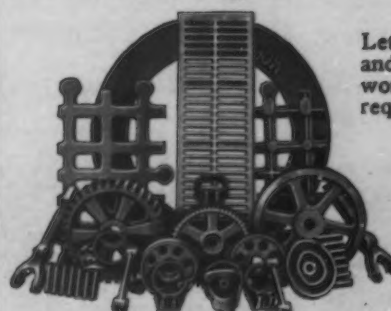
Damascus & Keystone Bronze Div.,

PITTSBURGH, PA.

Chicago Div.

CLEARING, ILL.

Castings—The kind you want



Let us put our facilities and long experience to work on your casting requirements.

Malleable Iron, Semi-Steel, Low and Special Carbon, Nickel and Vanadium Steel.



MALLEABLE IRON FITTINGS CO.

BRANFORD, CONN.

Products Index

ENGINES—Gas

Fairbanks, Morse & Co., Chicago.
Worthington Pump & Machinery Corp.,
Harrison, N. J.

ENGINES—Oil

Ingersoll-Rand Co., 11 Broadway, New
York City.
Worthington Pump & Machinery Corp.,
Harrison, N. J.

EYELET MACHINES

Manville, E. J. Mch. Co., Waterbury, Ct.
Waterbury (Conn.) Farrel Foundry & Ma-
chine Co., The.

FACING CLAY

Carborundum Co., The, Perth Amboy, N.J.

FACTORY & PLANT SITES

Zoll, Edward H., 196 Market St., Newark,
N. J.

FANS—Cooling

Perkins, B. F., & Son, Inc., Holyoke, Mass.

FANS—Ventilating

American Blower Corp., 6000 Russell St.,
Detroit.
Bendix Products Corp., 413 Bendix Drive,
South Bend, Ind.
Clargue Fan Co., Kalamazoo, Mich.
DeVilbiss Co., The, Toledo, Ohio.

FEED WATER HEATERS AND PURIFIERS

Harrisburg (Pa.) Steel Corp.

FEEDS—Hydraulic, for Machines

American Engineering Co., Philadelphia.
Oilgear Co., The, 1311 W. Bruce St., Mil-
waukee.

FELT—Wool Mechanical

American Felt Co., 315 Fourth Ave., N.Y.C.

FENCING—Wire

Pittsburgh (Pa.) Steel Co.

FERRALLOYS

Climax Molybdenum Co., 500 Fifth Ave.,
N. Y. C.
Electro Metallurgical Sales Corp., 30 E.
42nd St., N. Y. C.
Ohio Ferro-Alloys Corp., Canton, Ohio.
Pittsburgh Metallurgical Co., Inc., Niag-
ara Falls, N. Y.
Titanium Alloy Mfg. Co., The, Niagara
Falls, N. Y.
Vanadium Corp. of America, 420 Lexington
Ave., N. Y. C.

FERROCHROME

Electro Metallurgical Sales Corp., 30 E.
42nd St., N. Y. C.
Ohio Ferro-Alloys Corp., Canton, Ohio.
Pittsburgh Metallurgical Co., Inc., Niag-
ara Falls, N. Y.
Samuel, Frank, & Co., Inc., Philadelphia.
Vanadium Corp. of America, 420 Lexing-
ton Ave., N. Y. C.

FERROMANGANESE

Electro Metallurgical Sales Corp., 30 E.
42nd St., N. Y. C.
Ohio Ferro-Alloys Corp., Canton, Ohio.
Pittsburgh Metallurgical Co., Inc., Niag-
ara Falls, N. Y.
Samuel, Frank, & Co., Inc., Philadelphia.

FERROMOLYBDENUM

Climax Molybdenum Co., 500 Fifth Ave.,
N. Y. C.
Vanadium Corp. of America, 420 Lexing-
ton Ave., N. Y. C.

FERROSILICO MANGANESE

Ohio Ferro-Alloys Corp., Canton, Ohio.
Pittsburgh Metallurgical Co., Inc., Niag-
ara Falls, N. Y.
Vanadium Corp. of America, 420 Lexing-
ton Ave., N. Y. C.

FERROSILICON

Electro Metallurgical Sales Corp., 30 E.
42nd St., N. Y. C.
Ohio Ferro-Alloys Corp., Canton, Ohio.
Pittsburgh Metallurgical Co., Inc., Niag-
ara Falls, N. Y.
Samuel, Frank, & Co., Inc., Philadelphia.
Vanadium Corp. of America, 420 Lexing-
ton Ave., N. Y. C.

FERROSILICON ALUMINUM

Vanadium Corp. of America, 420 Lexing-
ton Ave., N. Y. C.

FERROSPIEGELEISEN

New Jersey Zinc Co., The, 160 Front St.,
N. Y. C.

FERROTITANIUM

Titanium Alloys Mfg. Co., The, Niagara
Falls, N. Y.
Vanadium Corp. of America, 420 Lexing-
ton Ave., N. Y. C.

FERROVANADIUM

Electro Metallurgical Sales Corp., 30 E.
42nd St., N. Y. C.
Vanadium Corp. of America, 420 Lexing-
ton Ave., N. Y. C.

FILES & RASPS

Diston, Henry, & Sons, Inc., Philadelphia.
Nicholson File Co., Providence, R. I.

FILING MACHINES

Continental Machine Specialties, Inc.,
Minneapolis, Minn.

FILTER CLOTH—Asbestos

Johns-Manville Corp., 22 East 40th St.,
New York City.

FILTERS—Air

American Air Filter Co., Inc., Louisville,
Ky.

FILTERS—Oil

National Acme Co., The, Cleveland.

FILTERS—Pressure or Gravity

Scalfe, Wm. B., & Sons Co., Pittsburgh.

FIRE BRICK—Insulating

Babcock & Wilcox Co., The, 85 Liberty
St., New York City.
Quigley Co., Inc., 56 West 45th St.,
N. Y. C.

FIRE CLAY

Carborundum Co., The, Perth Amboy, N. J.
Illinois Clay Products Co., Joliet, Ill.

FITTINGS—Brass, Pipe and Tube

Commonwealth Brass Corp., Detroit.

FLANGES—Forged Steel

Harrisburg (Pa.) Steel Corp.
Standard Steel Wks. Co., Burnham, Pa.

FLANGING WORK—Carbon and Alloy

Worth Steel Co., Claymont, Del.

FLEXIBLE SHAFT EQUIPMENT

Lovejoy Flexible Coupling Co., Chicago.
Strand, N. A., & Co., Chicago.

FLOODLIGHTS—Acetylene

Linde Air Prods. Co., The, 30 East 42nd
St., N. Y. C.

FLOOR ARMORING

Acme Steel Co., Chicago, Ill.

FLOOR (CONCRETE) REPAIR MATERIALS

Flexrock Co., 892 N. Delaware Ave.,
Phila., Pa.

FLOOR PLATES—See Plates—Floor or

Cellar Door

FLOORING—Acid Proof

Nukem Products Corp., 68 Niagara St.,
Buffalo, N. Y.

FLOORING—Monolithic

Johns-Manville Corp., 22 East 40th St.,
New York City.

FLOORING—Open Steel

Blaw-Knox Co., Pittsburgh.
Hendrick Mfg. Co., Carbondale, Pa.

FLOORING—Steel

American Pressed Steel Co., Phila., Pa.

FLUX—Welding

Linde Air Prods. Co., The, 30 E. 42nd
St., N. Y. C.

FORGINGS—Alloy Steel

Heppenstall Co., Pittsburgh.
National Forge & Ordnance Co., Irvine, Pa.

FORGINGS—Aluminum

Aluminum Co. of America, Pittsburgh.

FORGINGS—Brass, Bronze or Copper

American Brass Co., The, Waterbury, Conn.
Commonwealth Brass Corp., Detroit.
Revere Copper & Brass, Inc., 230 Park
Ave., N. Y. C.

FORGINGS—Cold Pressed

Rockford (Ill.) Drop Forge Co.

FORGINGS—Drop, Iron or Steel

Atlas Drop Forge Co., Lansing, Mich.
Canton (Ohio) Drop Forging & Mfg. Co.
Carnegie-Illinois Steel Corp. (U. S. Steel
Corp. Subsidiary), Pittsburgh & Chi-
cago.

FORGING & Casting Corp., The, Ferndale,

Mich.

Hartford (Conn.) Drop Forge Co., The,

Poor & Co., Canton Forge & Axle Wks.,
Canton, Ohio

Rockford (Ill.) Drop Forge Co.,

Storms Drop Forging Co., Springfield,
Mass.

Williams, J. H., & Co., Buffalo, N. Y.

FORGINGS—Hollow

Harrisburg (Pa.) Steel Corp.
National Forge & Ordnance Co., Irvine, Pa.

FORGINGS—Hollow Bored

American Hollow Boring Co., 1912 Rasp-
berry St., Erie, Pa.

FORGINGS—Hydraulic Press, Iron or

Steel

Atlas Drop Forge Co., Lansing, Mich.
Bethlehem (Pa.) Steel Company.
Mesta Mch. Co., Pittsburgh.
Midvale Co., The, Nicetown, Phila., Pa.
National Forge & Ordnance Co., Irvine, Pa.
Standard Steel Wks. Co., Burnham, Pa.

FORGINGS—Magnesium Alloys

Dow Chemical Co., The, 921 Jefferson Ave.,
Midland, Mich.

FORGINGS—Upset

Bethlehem (Pa.) Steel Company.
Rockford (Ill.) Drop Forge Co.

FORMING MACHINES—Roll

Kane & Roach, Inc., Syracuse, New York.

FOUNDRY EQUIPMENT & SUPPLIES

Jeffrey Mfg. Co., The, Columbus, Ohio.
Whiting Corp., Harvey, Ill.

FURNACE ENGINEERS

Electric Furnace Co., The, Salem, Ohio.
Flinn & Drefflein Co., Chicago.
Surface Combustion Corp., 2375 Dorr St.,
Toledo.

FURNACES—Annealing & Case Harden-

ing
American Gas Furnace Co., Elizabeth, N. J.
Electric Furnace Co., The, Salem, Ohio.
Leeds & Northrup Co., Philadelphia.
Surface Combustion Corp., 2375 Dorr St.,
Toledo.

FURNACES—Billot or Ingot Heating

Flinn & Drefflein Co., Chicago.

Surface Combustion Corp., 2375 Dorr St.,

Toledo.

FURNACES—Electric, Steel Melting

American Bridge Co. (U. S. Steel Corp.
Subsidiary), Pittsburgh.
General Electric Co., Schenectady, N. Y.
Pittsburgh (Pa.) Electromelt Furnace Corp.

FURNACES—Enameling

Carborundum Co., The, Perth Amboy, N. J.
Electric Furnace Co., The, Salem, Ohio.
Surface Combustion Corp., 2375 Dorr St.,
Toledo.

FURNACES—Forging

Electric Furnace Co., The, Salem, Ohio.
Holcroft & Co., Detroit.
Surface Combustion Corp., 2375 Dorr St.,
Toledo.

FURNACES—Heat Treating, Automatic

Amer. Gas Furnace Co., Elizabeth, N. J.
Electric Furnace Co., The, Salem, Ohio.
Holcroft & Co., Detroit.

Leeds & Northrup Co., Philadelphia,

Rockwell, W. S. Co., 50 Church St., N.Y.C.

Surface Combustion Corp., 2375 Dorr St.,

Toledo.

FURNACES—Heat Treating, Cyanide of

Lead

Chicago (Ill.) Flexible Shaft Co.
Electric Furnace Co., The, Salem, Ohio.
Surface Combustion Corp., 2375 Dorr St.,
Toledo.

FURNACES—Heat Treating, Electric

Electric Furnace Co., The, Salem, Ohio.
General Electric Co., Schenectady, N. Y.
Holcroft & Co., Detroit.

Hoskins Mfg. Co., Detroit, Mich.

Leeds & Northrup Co., Philadelphia.

Machler, Paul Co., The, Chicago.

Rockwell, W. S. Co., 50 Church St., N.Y.C.

Westinghouse Electric & Mfg. Co., East
Pittsburgh, Pa.

FURNACES—Heat Treating, Oil or Gas

Chicago (Ill.) Flexible Shaft Co.

Electric Furnace Co., The, Salem, Ohio.

Holcroft & Co., Detroit.

Machler, Paul Co., The, Chicago.

Rockwell, W. S. Co., 50 Church St., N.Y.C.

Surface Combustion Corp., 2375 Dorr St.,
Toledo.

FURNACES—Pack Heating Sheets

Aetna-Standard Engineering Co., The,
Youngstown, Ohio.

Wean Engineering Co., Inc., The, Warren,
Ohio.

FURNACES—Rivet Heating, Electric

General Electric Co., Schenectady, N. Y.

FURNACES—Wire, Annealing and Gal-

vanizing

General Electric Co., Schenectady, N. Y.

Surface Combustion Corp., 2375 Dorr St.,
Toledo.

GAGE BLOCKS

Ford Motor Co. (Johansson Division),
Dearborn, Mich.
Pratt & Whitney Div. Niles-Bement-Pond
Co., Hartford, Conn.

GAGES—Dial

Starrett, L. S. Co., Athol, Mass.

GAGES—Electric

Sheffield Gage Corp., Dayton, Ohio.

GAGES—Plug and Snap

Pratt & Whitney Div. Niles-Bement-Pond
Co., Hartford, Conn.

Sheffield Gage Corp., Dayton, Ohio.

Taft-Peirce Mfg. Co., The, Woonsocket, R.I.

GAGES—Thickness, for Rolling Mills

Haines Gage Co., The, Phila., Pa.

GAGES—Thread Lead

Aetna-Standard Engineering Co., The,
Youngstown, Ohio.

Erie (Pa.) Foundry Co.

GAS ANALYSIS RECORDERS

Leeds & Northrup Co., Philadelphia.

GAS FOR INDUSTRIAL USES

American Gas Association, 420 Lexington
Ave., N. Y. C.

GAS PRODUCERS

Flinn & Drefflein Co., Chicago.

Koppers Co., Pittsburgh.

Morgan Construction Co., Worcester, Mass.

Wood, R. D., & Co., Philadelphia.

GAS RECOVERY COKE OVENS

Koppers Co., Pittsburgh.

GASKETS—Asbestos, Metal or Rubber

Garlock Packing Co., The, Palmyra, N. Y.

Johns-Manville Corp., 22 East 40th St.,
New York City.

GASKETS—Rubber

Goodrich, B. F. Co., The, Akron, Ohio.

GEAR CHECKING EQUIPMENT

Michigan Tool Co., Detroit.

GEAR CUTTING

Earle Gear & Machine Co., Phila.
Farrel-Birmingham Co., Inc., Buffalo, N.Y.
Gleason Works, Rochester, N. Y.
James, D. O., Mfg. Co., Chicago.

Jones, W. A., Fdry. & Mch. Co., 4401
Roosevelt Rd., Chicago.

Philadelphia (Pa.) Gear Works.

Taylor-Wilson Mfg. Co., McKees Rocks, Pa.

GEAR CUTTING MACHINES

Brown & Sharpe Mfg. Co., Provr., R. I.

Farrel-Birmingham Co., Inc., Buffalo, N.Y.

Gleason Works, Rochester, N. Y.

GEAR DRIVES—Herringbone

Jones, W. A., Fdry. & Mch. Co., 4401
Roosevelt Rd., Chicago.

Lewis Foundry & Mch. Co., Pittsburgh.

United Engineering & Fdry. Co., Pgh.

GEAR LAPPING MACHINES

Michigan Tool Co., Detroit.

GEARMOTORS

Allis-Chalmers Mfg. Co., Milwaukee.

James, D. O., Mfg. Co., Chicago.

Reliance Electric & Engng. Co., Cleveland.

Westinghouse Elec. & Mfg. Co., East Pgh.

GEAR PLANNING MACHINES

Gleason Works, Rochester, N. Y.

GEAR SHAVING MACHINES

Michigan Tool Co., Detroit.

GEARS—Bevel

Boston Gear Wks., Inc., North Quincy,
Mass.

Gleason Works, Rochester, N. Y.

James, D. O., Mfg. Co., Chicago.

Richardson Co., The, Melrose Park, Ill.

GEARS—Heat Treated

Gleason Works, Rochester, N. Y.

James, D. O., Mfg. Co., Chicago

Products Index

GREASE—Lubricating
Gulf Oil Corp., Gulf Refining Co., Pitts-
burgh.
Shell's Industrial Lubricants Div., Shell
Bldg., San Francisco, Shell Bldg.,
St. Louis, & 50 W. 50th St., N. Y. C.
Soco-Vacuum Oil Co., Inc., 26 Broad-
way, N. Y. C.
Standard Oil Co. (Indiana), Chicago.
Sun Oil Co., Philadelphia.
Tide Water Associated Oil Co., 17 Battery
Place, N. Y. C.

GRILLES—Metal Cane
Diamond Mfg. Co., Wyoming, Pa.

GRILLES—Perforated Metal
Erdle Perforating Co., Rochester, N. Y.
Harrington & King Perforated Co., Chi-
cago.

**GRINDING AND POLISHING MA-
CHINES**
Excelsior Tool & Mch. Co., E. Et. Louis, Ill.
Hammond Machinery Builders, Inc., Kala-
mazoo, Mich.
Norton Co., Worcester, Mass.
Vonnegut Moulder Corp., 1807 Madison
Ave., Indianapolis, Ind.

GRINDING MACHINES—Centerless
Cincinnati (Ohio) Grinders Incorporated.
GRINDING MACHINES—Chucking
Bryant Chucking Grinder Co., Springfield,
Vt.

**GRINDING MACHINES—Cutter &
Reamer**
Cincinnati (Ohio) Milling Mch. Co., The
Gallmeyer & Livingston Co., Grand
Rapids, Mich.
Landis Tool Co., Waynesboro, Pa.

GRINDING MACHINES—Cylinder
Heald Mch. Co., Worcester, Mass.
Hutto Machine Division, Carborundum Co.,
Detroit.

GRINDING MACHINES—Cylindrical
Brown & Sharpe Mfg. Co., Providence, R.I.
Cincinnati (Ohio) Grinders Incorporated.
Landis Tool Co., Waynesboro, Pa.
Norton Co., Worcester, Mass.

GRINDING MACHINES—Die
Landis Mch. Co., Inc., Waynesboro, Pa.
GRINDING MACHINES—Drill
Gallmeyer & Livingston Co., Grand
Rapids, Mich.

GRINDING MACHINES—Gear & Worm
Pratt & Whitney Div. Niles-Bement-Pond
Co., Hartford, Conn.

GRINDING MACHINES—Internal
Bryant Chucking Grinder Co., Springfield,
Vt.
Greenfield (Mass.) Tap & Die Corp.
Heald Mch. Co., Worcester, Mass.
Hutto Machine Division, Carborundum Co.,
Detroit.

**GRINDING MACHINES—Internal Center-
less**
Heald Mch. Co., Worcester, Mass.

**GRINDING MACHINES—Internal Multi-
ple Spindle**
Baird Mch. Co., The Bridgeport, Conn.

**GRINDING MACHINES—Portable Elec-
tric**
Wodack Electrical Tool Corp., Chicago.

**GRINDING MACHINES—Portable Flexi-
ble Shaft**
Pratt & Whitney Div. Niles-Bement-Pond
Co., Hartford, Conn.

**GRINDING MACHINES—Portable Pneu-
matic**
Cleveland (Ohio) Pneumatic Tool Co., The
Ingersoll-Rand Co., 11 Broadway, New
York City.

GRINDING MACHINES—Roll
Cincinnati (Ohio) Grinders Incorporated.
Farrel-Birmingham Co., Inc., Ansonia,
Conn.

GRINDING MACHINES—Saw
Heller Machine Co., 114 Liberty St.,
N. Y. C.

GRINDING MACHINES—Snagging
Vonnegut Moulder Corp., 1807 Madison
Ave., Indianapolis, Ind.
Warner & Swasey Co., The, Cleveland.

GRINDING MACHINES—Surface
Abrasive Machine Tool Co., E. Prov., R. I.
Blanchard Machine Co., The, Cambridge,
Mass.

GRINDING MACHINES—Universal
Cincinnati (Ohio) Grinders Incorporated.
Landis Tool Co., Waynesboro, Pa.
Norton Co., Worcester, Mass.

GRINDING MACHINES—Valve
Landis Tool Co., Waynesboro, Pa.

GRINDING WHEELS
Bakelite Corp., 347 Park Ave., N. Y. C.
Blanchard Machine Co., The, Cambridge,
Mass.
Carborundum Co., The, Niagara Falls, N. Y.
Macklin Co., Jackson, Mich.
Manhattan Rubber Mfg. Div. of Ray-
bestor-Manhattan, Inc., The, 2 Town-
send St., Passaic, N. J.
Norton Co., Worcester, Mass.

GRINDING WHEELS—Segment
Blanchard Machine Co., The, Cambridge,
Mass.

GRIT—Steel
Pittsburgh (Pa.) Crushed Steel Co.

**HACK SAW BLADES—See Saws—Hack
Saw Blades**

HACK SAW MACHINES
Armstrong-Blum Mfg. Co., Chicago.
Peerless Mch. Co., Racine, Wis.

HAMMER BOARDS
Irwin, H. G., Lumber Co., 1129 State St.,
Erie, Pa.

HAMMERS—Air Forging
Nasol Engineering & Machine Works, Phila-
delphia.

HAMMERS—Drop
Bliss, E. W., Co., Toledo, Ohio.
Erie (Pa.) Foundry Co.
Morgan Engineering Co., The, Alliance, O.
Standard Machinery Co., Providence, R. I.

HAMMERS—Helve
Bradley, C. C., & Son, Inc., Syracuse,
N. Y.

HAMMERS—Pneumatic
Cleveland (Ohio) Pneumatic Tool Co., The
Ingersoll-Rand Co., 11 Broadway, New
York City.

HAMMERS—Portable Electric
Wodack Electrical Tool Corp., Chicago.

HAMMERS—Power
Bradley, C. C., & Son, Inc., Syracuse,
N. Y.

HAMMERS—Rawhide
Chicago (Ill.) Rawhide Mfg. Co., 1306
Elson Ave.

**HAMMERS—Sealing & Chipping—Pneu-
matic**
Cleveland (Ohio) Pneumatic Tool Co., The
Ingersoll-Rand Co., 11 Broadway, New
York City.

HAMMERS—Steam
Erie (Pa.) Foundry Co.
Morgan Engineering Co., The, Alliance, O.

HANGERS—Ball Bearing
S. K. F. Industries, Inc., Front St. & Erie
Ave., Phila., Pa.

HANGERS—Roller Bearing
Hytatt Bearings Div., General Motors Corp.,
Newark, N. J.

HARDNESS TESTING MACHINES
Shore Instrument & Mfg. Co., The, Jami-
ca, L. I., N. Y.

HEADING MACHINES
Manville, E. J., Mch. Co., Waterbury, Ct.
Waterbury (Conn.) Farrel Foundry & Ma-
chine Co., The.

HEADS—Spun and Pressed
Central Iron & Steel Co., Harrisburg, Pa.
Worth Steel Co., Claymont, Del.

HEADS—Steel—Flanged & Dish
Central Iron & Steel Co., Harrisburg, Pa.

HEAT RESISTING PRODUCTS—Electric
Globe Div., The Carborundum Co.,
Niagara Falls, N. Y.

HEAT TREATING
Holden, A. F., Co., New Haven, Conn.
Harnischfeger Corp., 4401 W. National
Ave., Milwaukee, Wis.

HEAT TREATING EQUIPMENT—Air
Draw
Holden, A. F., Co., New Haven, Conn.
Machler, Paul Co., The, Chicago.
Surface Combustion Corp., 2375 Dorr St.,
Toledo.

HEATING RESISTANCE—Non-Metallic
Globe Div., The Carborundum Co.,
Niagara Falls, N. Y.

HOISTS—Air
Curtis Pneumatic Machinery Co., 1948
Klien Ave., St. Louis, Mo.
Detroit (Mich.) Hoist & Mch. Co.

HOISTS—Chain
Wright Mfg. Div., American Chain &
Cable Co., Inc., York, Pa.

HOISTS—Electric
American Engineering Co., Philadelphia.
Detroit (Mich.) Hoist & Mch. Co.
Euclid Crane & Hoist Co., The, Euclid, O.

HOISTS—Hand
Northern Engineering Works, Detroit,
Mich.
Philadelphia (Pa.) Gear Works.
Robbins & Myers, Inc., Springfield, Ohio.

HOISTS—Rope
Shepard Niles Crane & Hoist Corp., Mon-
teur Falls, N. Y.
Wright Mfg. Div., American Chain &
Cable Co., Inc., York, Pa.

HOISTS—Electric Traveling
American Monorail Co., The, Cleveland.
Cleveland Tramrail Div. of The Cleveland
Crane & Engng. Co., Wickliffe, Ohio.
Euclid Crane & Hoist Co., The, Euclid, O.
Northern Engineering Works, Detroit.
Shaw-Box Crane & Hoist Co., Inc., 402
Broadway, Muskegon, Mich.

HOISTS—Movable
Cleveland Tramrail Div. of The Cleveland
Crane & Engng. Co., Wickliffe, Ohio.
Euclid Crane & Hoist Co., The, Euclid, O.

HOISTS—Rope
Shepard Niles Crane & Hoist Corp., Mon-
teur Falls, N. Y.

HOISTS—Scraper
Sullivan Machinery Co., Claremont, N. H.

HOSE—Flexible Metallic
American Brass Co., The, Waterbury, Conn.

HOSE—Rubber
Goodrich, B. F., Co., Akron, Ohio.
Goodyear Tire & Rubber Co., Akron, Ohio.
Manhattan Rubber Mfg. Div. of Ray-
bestor-Manhattan, Inc., The, 2 Townsend
St., Passaic, N. J.

HYDRANTS—Fire
Wood, R. D., & Co., Philadelphia.

HYDRAULIC MACHINERY
Baldwin-Southwark Corp., Southwark Div.,
Philadelphia.
Edwards, Chas. F., Engng. Wks., Chicago.
Hydraulic Gmbh. Dulsburg, Germany.
Morgan Engineering Co., The, Alliance, O.

INGOT MOLDS
Shenango Furnace Co., Pittsburgh.
Shenango-Penn Mold Co., Pittsburgh.
Snyder, W. P., & Co., Pittsburgh.
Valley Mould & Iron Corp., Hubbard, Ohio.

INGOTS—Aluminum
Aluminum Co. of America, Pittsburgh.
Scherer, Arthur, & Co., Inc., 38 Rocke-
feller Plaza, R. C. A. Bldg., N. Y. C.

INGOTS—Phosphor Bronze
Phosphor Bronze Smelting Co., The, Phila-
delphia.

INSTRUMENTS—Recording
Leeds & Northrup Co., Philadelphia.

INSULATION
Johns-Manville Corp., 23 East 40th St.,
New York City.

IRON—Genuine Open Hearth Iron
Newport (Ky.) Rolling Mill Co., The.

IRON—Rustless
Ludlum Steel Co., Watervliet, N. Y.

**JIGS, FIXTURES, DIES, etc. (See Dies,
Jigs, Fixtures, etc.)**

KEYS—Riveted
Western Wire Prods. Co., St. Louis, Mo.

KEYEATING MACHINES
Baker Bros., Inc., Toledo, Ohio.
Davis Keyeater Co., 400 Exchange St.,
Rochester, N. Y.

LACQUER
Boxall Flexible Lacquer Co., Inc., Eliza-
beth, N. J.
Sherwin-Williams Co., Cleveland.

LAMP—Mercury Vapor
General Electric Vapor Lamp Co., Ho-
boken, N. Y. C.

LAPPING MACHINES
Cincinnati (Ohio) Grinders Incorporated.

LATHES—Automatic
Baird Mch. Co., The, Bridgeport, Conn.
Bullard Co., The, Bridgeport, Conn.
Gisholt Machine Co., Madison, Wis.

LATHES—Bed
Pratt & Whitney Div. Niles-Bement-Pond
Co., Hartford, Conn.

LATHES—Bench
Rivett Lathe & Grinder, Inc., Boston, Mass.

LATHES—Swiss
Warner & Swasey Co., The, Cleveland.

LATHES—Chucking
Jones & Lamson Mch. Co., Springfield, Vt.
Warner & Swasey Co., The, Cleveland.

LATHES—Center Turning
Monarch Mch. Tool Co., The, Sidney, O.

LATHES—Crankshaft
LeBlond, R. K., Mch. Tool Co., Cincinnati.

LATHES—Engine
Hill-Clarke Mch. Co., 647 W. Washing-
ton Blvd., Chicago.
LeBlond, R. K., Mch. Tool Co., Cincinnati.
Monarch Mch. Tool Co., The, Sidney, O.

LATHES—Hand
Pratt & Whitney Div. Niles-Bement-Pond
Co., Hartford, Conn.

LATHES—Lathe
Lewis Foundry & Mch. Co., Pittsburgh.
Mesta Mch. Co., Pittsburgh.

**LATHES—Second-Hand. (See Clearing
House Section)**

LATHES—Toolroom
LeBlond, R. K., Machine Tool Co., Cin-
cinnati, Ohio.
Monarch Mch. Tool Co., The, Sidney, O.
Pratt & Whitney Div. Niles-Bement-Pond
Co., Hartford, Conn.

LATHES—Turret
Acme Machine Tool Co., Cincinnati.
Bardons & Oliver, Cleveland.
Bullard Co., The, Bridgeport, Conn.

LATHES, Turret, Vertical
Bullard Co., The, Bridgeport, Conn.
Rogers Machine Wks., Alfred, New York.

LAYOUT FLUID
Dayton Rogers Mfg. Co., Minneapolis,
Minn.

LEAD—in Oil
Sherwin-Williams Co., Cleveland.

LEAD LININGS
Dietzel Lead Burning Co., Pittsburgh.

LEATHER—Cup
Chicago (Ill.) Rawhide Mfg. Co., The,
1306 Elson Ave.

LEVELING MACHINES
Acme-Standard Engineering Co., The,
Youngstown, Ohio.
Schatz Mfg. Co., The, Poughkeepsie, N. Y.

LOCK WASHER MACHINERY
Sleeper & Hartley, Inc., Worcester, Mass.

LOCOMOTIVES—Electric
Atlas Car & Mfg. Co., The, Cleveland.
Davenport (Iowa) Locomotives Works.
General Electric Co., Schenectady, N. Y.

LOCOMOTIVES—Gas-Electric
Davenport (Iowa) Locomotives Works.

LOCOMOTIVES—Industrial
Davenport (Iowa) Locomotives Works.
Jeffrey Mfg. Co., The, Columbus, Ohio.

LOCOMOTIVES—Storage Battery
Atlas Car & Mfg. Co., The, Cleveland.

LUBRICANTS—Crusher & Grinding
Gulf Oil Corp., Gulf Refining Co., Pitts-
burgh.

LUBRICANTS—Gear
Shell's Industrial Lubricants Div., Shell
Bldg., San Francisco, Shell Bldg.,
St. Louis, & 50 W. 50th St., N. Y. C.

**LUBRICANTS—High Pressure &
Temperature**
Gulf Oil Corp., Gulf Refining Co., Pitts-
burgh.

LUBRICANTS—Mine Cars
Gulf Oil Corp., Gulf Refining Co., Pitts-
burgh.

LUBRICANTS—Railroad
Gulf Oil Corp., Gulf Refining Co., Pitts-
burgh.

LUBRICANTS—Saw
Shell's Industrial Lubricants Div., Shell
Bldg., San Francisco, Shell Bldg.,
St. Louis, & 50 W. 50th St., N. Y. C.

LUBRICANTS—Steel
Shell's Industrial Lubricants Div., Shell
Bldg., San Francisco, Shell Bldg.,
St. Louis, & 50 W. 50th St., N. Y. C.

LUBRICANTS—Taper
Shell's Industrial Lubricants Div., Shell
Bldg., San Francisco, Shell Bldg.,
St. Louis, & 50 W. 50th St., N. Y. C.

LUBRICANTS—Valve
Shell's Industrial Lubricants Div., Shell
Bldg., San Francisco, Shell Bldg.,
St. Louis, & 50 W. 50th St., N. Y. C.

LUBRICANTS—Welding
Shell's Industrial Lubricants Div., Shell
Bldg., San Francisco, Shell Bldg.,
St. Louis, & 50 W. 50th St., N. Y. C.

LUBRICANTS—Worm
Shell's Industrial Lubricants Div., Shell
Bldg., San Francisco, Shell Bldg.,
St. Louis, & 50 W. 50th St., N. Y. C.

LUBRICANTS—Worm
Shell's Industrial Lubricants Div., Shell
Bldg., San Francisco, Shell Bldg.,
St. Louis, & 50 W. 50th St., N. Y. C.

LUBRICANTS—Worm
Shell's Industrial Lubricants Div., Shell
Bldg., San Francisco, Shell Bldg.,
St. Louis, & 50 W. 50th St., N. Y. C.

LUBRICANTS—Worm
Shell's Industrial Lubricants Div., Shell
Bldg., San Francisco, Shell Bldg.,
St. Louis, & 50 W. 50th St., N. Y. C.

LUBRICANTS—Worm
Shell's Industrial Lubricants Div., Shell
Bldg., San Francisco, Shell Bldg.,
St. Louis, & 50 W. 50th St., N. Y. C.

LUBRICANTS—Worm
Shell's Industrial Lubricants Div., Shell
Bldg., San Francisco, Shell Bldg.,
St. Louis, & 50 W. 50th St., N. Y. C.

LUBRICANTS—Worm
Shell's Industrial Lubricants Div., Shell
Bldg., San Francisco, Shell Bldg.,
St. Louis, & 50 W. 50th St., N. Y. C.

LUBRICANTS—Worm
Shell's Industrial Lubricants Div., Shell
Bldg., San Francisco, Shell Bldg.,
St. Louis, & 50 W. 50th St., N. Y. C.

LUBRICANTS—Worm
Shell's Industrial Lubricants Div., Shell
Bldg., San Francisco, Shell Bldg.,
St. Louis, & 50 W. 50th St., N. Y. C.

LUBRICANTS—Worm
Shell's Industrial Lubricants Div., Shell
Bldg., San Francisco, Shell Bldg.,
St. Louis, & 50 W. 50th St., N. Y. C.

Certified
MALLEABLE IRON CASTINGS
 Detachable Sprocket Chain
 Riveted Sprocket Chain
 Malleable Washers, etc.
PEORIA MALLEABLE CASTINGS CO.
 AT 2800 N. ADAMS ST. PEORIA, ILLINOIS

Carbon Malleable Casting Co.
 INCORPORATED
 HIGH GRADE MALLEABLE IRON CASTINGS OF UNIFORM QUALITY
 AND HIGH STANDARD. WE SPECIALIZE ON TRUE TO PATTERN
 WORK. ALSO BRASS AND ALUMINUM CASTINGS
724 S. Prince St. Lancaster, Pa.

STAMPED METAL PARTS



for every industry
 We have had many
 years of Light and
 Heavy Stamping
 Experience. We of-
 fer you the benefit
 of our knowledge
 and equipment.

WORCESTER STAMPED METAL CO.
 Established 1883 WORCESTER, MASS.

There is a
Toledo Alloy Steel
 for every need
THE INDUSTRIAL STEEL CASTING CO.
 Toledo, Ohio

Hayward Buckets



A bucket for every digging and rehan-
 dling need. . . A size for every job.
THE HAYWARD CO., 46-50 Church St., N. Y.

ELEVATORS Steam Hydraulic
 The Ridgway Steam Hydraulic Elevator is PERFECTION for the
 man who has steam or air available.
Hundreds in use in Biggest Plants
 "HOOK 'ER TO THE BILER!"
CRAIG RIDGWAY & SON CO., COATESVILLE, PA.

CONCO CRANES
 BUILDERS FOR 20 YEARS—ALL TYPES.
 IN CAPACITIES TO 20 TONS—HOISTS—TROLLEYS
CONCO ENGINEERING WORKS
 DIVISION OF H. D. CONKEY & COMPANY
 405 CARLSON AVE. MENDOTA, ILL.

Products Index

LUBRICANTS—Roll Neck—Anti-Friction & Plain

Gulf Oil Corp., Gulf Refining Co., Pitts-
 burgh.
 Shell's Industrial Lubricants Div., Shell
 Bldg., San Francisco; Shell Bldg.,
 St. Louis, and 50 W. 50th St., N. Y. C.
 Socony-Vacuum Oil Co., Inc., 26 Broad-
 way, N. Y. C.
 Standard Oil Co. (Indiana), Chicago.
 Sun Oil Co., Philadelphia.
 Texas Company, The, 135 East 42nd St.,
 N. Y. C.
 Tide Water Associated Oil Co., 17 Battery
 Place, N. Y. C.

LUBRICANTS—Tippie & Cleaning

Gulf Oil Corp., Gulf Refining Co., Pitts-
 burgh.
 Shell's Industrial Lubricants Div., Shell
 Bldg., San Francisco; Shell Bldg., St.
 Louis, and 50 W. 50th St., N. Y. C.
 Socony-Vacuum Oil Co., Inc., 26 Broad-
 way, N. Y. C.
 Sun Oil Co., Philadelphia.
 Texas Company, The, 135 East 42nd St.,
 N. Y. C.
 Tide Water Associated Oil Co., 17 Battery
 Place, N. Y. C.

MACHINE GUARD MATERIALS

Erdle Perforating Co., Rochester, N. Y.

MACHINE WORK

Franklin Mfg. Co., The, New Haven, Conn.
 General Machine Works, York, Pa.
 Houde Engineering Corp., Buffalo, N. Y.
 National Rubber Machinery Co., Clifton
 Div., Clifton, N. J.
 Taft-Peirce Mfg. Co., The, Woonsocket, R. I.

MACHINERY DEALERS—Second-Hand.

(See Clearing House Section)

MACHINISTS' SMALL TOOLS

Starrett, L. S., Co., Athol, Mass.

MAGNESITE—Brick or Dead Burnt

Carborundum Co., The, Perth Amboy, N. J.

MAGNESIUM

Dow Chemical Co., The, 921 Jefferson Ave.,
 Midland, Mich.

MAGNETS—Lifting

Cutler-Hammer, Inc., Milwaukee.
 Electric Controller & Mfg. Co., The, Cleve.
 Ohio Electric Mfg. Co., The, 5908 Maurice
 Ave., Cleveland.

MALLETS—Rawhide

Chicago (Ill.) Rawhide Mfg. Co., The,
 1306 Elston Ave.

MANDRELS—Expanding

Nicholson, W. H. & Co., 165 Oregon St.,
 Wilkes-Barre, Pa.

MANGANESE METAL AND ALLOYS

Electro Metallurgical Sales Corp., 30 East
 42nd St., N. Y. C.

MANHOLE FITTINGS AND SADDLES

Worth Steel Co., Claymont, Del.

MANIFOLDS—Oxygen & Acetylene

Air Reduction Sales Co., 60 East 42nd
 St., N. Y. C.
 Linde Air Prods. Co., The, 30 East 42nd
 St., N. Y. C.

MARKING MACHINES

Noble & Westbrook Mfg. Co., The, East
 Hartford, Conn.

METAL SPECIALTIES

Crosby Co., The, Buffalo, N. Y.
 Toledo (Ohio) Stamping & Mfg. Co.
 Torrington (Conn.) Company.
 Truscon Steel Co., Pressed Steel Div.,
 Cleveland.
 Whitehead Stamping Co., 1669 W. Lafay-
 ette Blvd., Detroit, Mich.
 Worcester (Mass.) Stamped Metal Co.

METAL—Thermostatic Bimetal

Chace, W. M., Co., 1605 Beard Ave., De-
 troit.

METERS—Electric Welding

Lincoln Electric Co., The, Cleveland.

METERS—Flow

Leeds & Northrup Co., Philadelphia.

METERS—Water & Oil

Worthington Pump & Machinery Corp.,
 Harrison, N. J.

MICA SCHIST

Edge Hill Silica Rock Co., New Bruns-
 wick, New Jersey.

MICROMETERS

Starrett, L. S., Co., Athol, Mass.

MICROMETERS—Automatic, for Rolling

Mills

Haines Gauge Co., The, Phila., Pa.

MILLING MACHINES—Automatic

Brown & Sharpe Mfg. Co., Prov., R. I.
 Cincinnati (Ohio) Milling Mch. Co., The.

MILLING MACHINES—Horizontal

Brown & Sharpe Mfg. Co., Prov., R. I.
 Cincinnati (Ohio) Milling Mch. Co., The.

MILLING MACHINES—Planer Type

Cincinnati (Ohio) Planer Co.

MILLING MACHINES—Second-Hand.

(See Clearing House Section)

MILLING MACHINES—Vertical

Brown & Sharpe Mfg. Co., Prov., R. I.
 Cincinnati (Ohio) Milling Mch. Co., The.

MOLDING MACHINES

Tabor Mfg. Co., Phila., Pa.

MOLYBDENUM

Climax Molybdenum Co., 500 Fifth Ave.,
 N. Y. C.

MONEL METAL

International Nickel Co., Inc., The, 67
 Wall St., N. Y. C.

MONORAIL SYSTEMS—Hand & Electric

American Monorail Co., The, Cleveland.
 Cleveland Tramrail Div. of The Cleveland
 Crane & Engng. Co., Wickliffe, Ohio.

MOTORS—Electric

Allis-Chalmers Mfg. Co., Milwaukee.
 Century Electric Co., St. Louis, Mo.
 Fairbanks, Morse & Co., Chicago.
 General Electric Co., Schenectady, N. Y.
 Harnischfeger Corp., 4401 W. National
 Ave., Milwaukee.
 Lincoln Electric Co., Cleveland.
 Reliance Electric & Engineering Co.,
 Cleveland.
 Westinghouse Elec. & Mfg. Co., E. Pgh.

MOTORS—Electric, Second-Hand. (See

Clearing House Section)

NAILES—Wire

American Steel & Wire Co. (U. S. Steel
 Corp. Subsidiary), Chicago.
 Columbia Steel Co. (U. S. Steel Corp.
 Subsidiary), San Francisco, Calif.
 Hassall, John, Inc., Clay & Oakland Sts.,
 Bklyn., N. Y.
 Pittsburgh (Pa.) Steel Co.

NICKEL

International Nickel Co., Inc., The, 67
 Wall St., N. Y. C.

NICKEL ANODES—Rolled or Cast

Riverside (N. J.) Metal Co.

Seymour (Conn.) Mfg. Co.

NICKEL SILVER

Riverside (N. J.) Metal Co.

Seymour (Conn.) Mfg. Co.

NITROGEN

Air Reduction Sales Co., 60 East 42nd
 St., N. Y. C.

NOZZLES—Sand Blasting

Norton Co., Worcester, Mass.

NUMBERING MACHINES—For Metal

Noble & Westbrook Mfg. Co., The, East
 Hartford, Ct.

NUT MACHINERY—Automatic Cold

Pressed

Waterbury (Conn.) Farrel Foundry & Ma-
 chine Co., The.

NUTS—Acorn

Republic Steel Corp., Upon Nut Div.,
 Cleveland, O.

Russell, Burdall & Ward Bolt & Nut Co.,
 Port Chester, N. Y.

NUTS—Castellated

National Acme Co., The, Cleveland.
 Republic Steel Corp., Upon Nut Div.,
 Cleveland, O.

Russell, Burdall & Ward Bolt & Nut
 Co., Port Chester, N. Y.

NUTS—Cold Punched

Republic Steel Corp., Upon Nut Div.,
 Cleveland, O.

Russell, Burdall & Ward Bolt & Nut
 Co., Port Chester, N. Y.

NUTS—Hot Pressed

Republic Steel Corp., Upon Nut Div.,
 Cleveland, O.

Russell, Burdall & Ward Bolt & Nut
 Co., Port Chester, N. Y.

NUTS—Lock

Standard Pressed Steel Co., Jenkintown,
 Pa.

NUTS—Machine Screw

Blake & Johnson Co., The, Waterville, Ct.

NUTS—Semi-Finished

Cleveland (Ohio) Cap Screw Co., The.
 Republic Steel Corp., Upon Nut Div.,
 Cleveland, O.

Russell, Burdall & Ward Bolt & Nut
 Co., Port Chester, N. Y.

NUTS—Thumb Malleable

Republic Steel Corp., Upon Nut Div.,
 Cleveland, O.

Russell, Burdall & Ward Bolt & Nut
 Co., Port Chester, N. Y.

NUTS—Wing

Parker-Kalon Corp., 196 Varick St.,
 N. Y. C.

OIL & GREASE SEALS

Chicago (Ill.) Rawhide Mfg. Co., The,
 1306 Elston Ave.

OIL—Fuel, Low Sulphur

Bennett Oil Co., Inc., 366 Madison Ave.,
 New York City.

OIL RETAINERS

Chicago (Ill.) Rawhide Mfg. Co., The,
 1306 Elston Ave.

OIL STONES

Carborundum Co., The, Niagara Falls,
 N. Y.

Norton Co., Worcester, Mass.

OILS—Cutting

Shell's Industrial Lubricants Div., Shell
 Bldg., San Francisco, Shell Bldg.,
 St. Louis, and 50 W. 50th St., N. Y. C.

Socony-Vacuum Oil Co., Inc., 26 Broad-
 way, N. Y. C.

Products Index

Standard Oil Co. (Indiana), Chicago, Ill.
Sun Oil Co., Philadelphia.
Tide Water Associated Oil Co., 17 Battery Place, N. Y. C.

OILS—Fuel
Gulf Oil Corp., Gulf Refining Co., Pittsburgh.
Socony-Vacuum Oil Co., Inc., 26 Broadway, N. Y. C.
Standard Oil Co. (Indiana), Chicago, Ill.
Sun Oil Co., Philadelphia.
Tide Water Associated Oil Co., 17 Battery Place, N. Y. C.

OILS—Lubricating
Gulf Oil Corp., Gulf Refining Co., Pittsburgh.
Shell's Industrial Lubricants Div., Shell Bldg., San Francisco, Shell Bldg., St. Louis, & 50 W. 50th St., N. Y. C.
Socony-Vacuum Oil Co., Inc., 26 Broadway, N. Y. C.
Standard Oil Co. (Indiana), Chicago.
Texas Company, The, 135 East 42nd St., N. Y. C.
Tide Water Associated Oil Co., 17 Battery Place, N. Y. C.

OILS—Soluble—See Oils—Cutting

ORES—Iron
Cleveland-Cliffs Iron Co., The, Cleveland, Ohio.
Hanna Furnace Corp., The, Detroit, Mich.
Pickands Mather & Co., Cleveland.
Shenango Furnace Co., Pittsburgh.
Snyder, W. P., & Co., Pittsburgh.

OVENS—Coke and By-Product Recovery
Koppers Co., Pittsburgh.

OVENS—Core and Mold
Herrington & Randall, Inc., Detroit.
Holcroft & Co., Detroit.

OVENS—Cross Regenerative
Koppers Co., Pittsburgh.

OVENS—Enameling and Japanning
Carborundum Co., The, Perth Amboy, N. J.

OVENS—Herrington & Randall, Inc., Detroit.
Maehler, Paul Co., The, Chicago.
Surface Combustion Corp., 2375 Dorr St., Toledo.

OXY-ACETYLENE—Shape-Cutting Machines
Air Reduction Sales Co., 60 East 42nd St., N. Y. C.

Linde Air Prods. Co., The, 30 East 42nd St., N. Y. C.

OXYGEN
Air Reduction Sales Co., 60 East 42nd St., N. Y. C.

Linde Air Prods. Co., The, 30 East 42nd St., N. Y. C.

PACKING—Felt
American Felt Co., 315 Fourth Ave., N. Y. C.

PACKING—Hydraulic
Rhoads, J. E. & Sons, Philadelphia.

PACKING—Leather
Chicago (Ill.) Rawhide Mfg. Co., The, 1306 Elston Ave.

Rhoads, J. E. & Sons, Philadelphia.

PACKING—Metallic
Garlock Packing Co., The, Palmyra, N. Y.

PACKING—Rubber
Goodrich, B. F. Co., The, Akron, Ohio.

Goodyear Tire & Rubber Co., Akron, Ohio.
Manhattan Rubber Mfg. Div. of Raybestos-Manhattan, Inc., The, 2 Townsend St., Passaic, N. J.

PACKING—Sheet, Asbestos or Rubber
Garlock Packing Co., The, Palmyra, N. Y.

Johns-Manville Corp., 22 East 40th St., New York City.

PAINT
Sherwin-Williams Co., Cleveland.

PERFORATED METAL
Chicago Perforating Co., 2440 W 24th Place, Chicago, Ill.

Diamond Mfg. Co., Wyoming, Pa.
Erdle Perforating Co., Rochester, N. Y.

Harrington & King Perforating Co., Chicago.

Hendrick Mfg. Co., Carbondale, Pa.
Mundt, Chas., & Sons, 59 Fairmount Ave., Jersey City, N. J.

Wickwire Spencer Steel Co., 41 East 42nd St., N. Y. C.

PHOSPHOR—Copper
Phosphor Bronze Smelting Co., The, Phila.

PICKLING COMPOUNDS
American Chemical Paint Co., Ambler, Pa.

PICKLING MACHINES
Aetna-Standard Engineering Co., The, Youngstown, Ohio.

Mesta Mch. Co., Pittsburgh.

PICKLING TANK LININGS
Celkote Co., The, Cleveland.

PICKLING TANK STEAM JETS
Dietzel Lead Burning Co., Pittsburgh.

Durlon Co., Inc., The, 438 N. Findlay St., Dayton, Ohio.

PIG IRON
Bethlehem (Pa.) Steel Co.

Brooke, E. & G. Iron Co., Birdsboro, Pa.
Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.

Cleveland-Cliffs Iron Co., The, Cleveland, Ohio.
Hanna Furnace Corp., The, Detroit, Mich.

Pickands Mather & Co., Cleveland.
Republic Steel Corp., Cleveland, Ohio.

Shenango Furnace Co., Pittsburgh.
Shenango-Penn Mold Co., Pittsburgh.

Superior Charcoal Iron Co., Grand Rapids, Mich.
Tennessee Coal, Iron & Railroad Co. (U. S. Steel Corp. Subsidiary), Birmingham, Ala.

PIG IRON—Charcoal
Superior Charcoal Iron Co., Grand Rapids, Mich.

PILING—Steel Pipe
National Tube Co. (U. S. Steel Corp. Subsidiary), Pittsburgh.

PILING—Steel Sheet
Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.

Jones & Laughlin Steel Corp., Pittsburgh.

PINIONS—Rolling Mill
Mesta Mch. Co., Pittsburgh.

PINIONS—Wire and Rod
Bathbone, A. R. & J., Palmer, Mass.

PINS—Cutter
Lamson & Sessions Co., The, Cleveland.

PIPE—Cast Iron, B. & S. and Flanged
Wood, R. D., & Co., Philadelphia.

PIPE—Hammer Welded
National Tube Co. (U. S. Steel Corp. Subsidiary), Pittsburgh.

PIPE—New and Second-Hand
Albert & Davidson Pipe Corp., 2nd Ave., 50-51st St., Bklyn., N. Y.

Albert Pipe Supply Co., Inc., Berry and N. 13th St., Bklyn., N. Y.
Greenpoint Iron & Pipe Co., Inc., Stagg & Bogart Sts., Bklyn., N. Y.

PIPE—Seamless Brass or Copper
American Brass Co., The, Waterbury, Conn.

Revere Copper & Brass, Inc., 230 Park Ave., N. Y. C.

PIPE—Spiral Welded
American Rolling Mill Co., Middletown, O.

PIPE—Standard, Black and Galvanized
Bethlehem (Pa.) Steel Co.

Jones & Laughlin Steel Corp., Pittsburgh.
National Tube Co. (U. S. Steel Corp. Subsidiary), Pittsburgh.

Republic Steel Corp., Cleveland, Ohio.
Youngstown (Ohio) Sheet & Tube Co., The.

PIPE—Welded, Electric
National Tube Co. (U. S. Steel Corp. Subsidiary), Pittsburgh.

Republic Steel Corp., Cleveland, Ohio.

PIPE COVERING—Asbestos
Johns-Manville Corp., 22 East 40th St., New York City.

PIPE FITTINGS
Crane Co., Chicago.

Jarecki Mfg. Co., Erie, Pa.

PIPE THREADING & CUTTING MACHINES
Aetna-Standard Engineering Co., The, Youngstown, Ohio.

Curtis & Curtis Co., The, Bridgeport, Conn.

Jarecki Mfg. Co., Erie, Pa.
Landis, Mach. Co., Inc., Waynesboro, Pa.

Marrell Mfg. Co., Toledo.
Murphy Machine & Tool Co., Detroit.

Taylor-Wilson Mfg. Co., McKees Rocks, Pa.

PLANERS
Cincinnati (Ohio) Planer Co.

PLANING MACHINES—Second Hand.
(See Clearing House Section)

PLASTICS—Laminated
Bakelite Corp., 247 Park Ave., N. Y. C.

PLASTICS—Laminated or Molded
Phenolic

Richardson Co., The, Melrose Park, Ill.

PLASTICS—Molded
Bakelite Corp., 247 Park Ave., N. Y. C.

PLASTICS—Synthetic
Bakelite Corp., 247 Park Ave., N. Y. C.

PLASTER'S CLEANING COMPOUND
American Chemical Paint Co., Ambler, Pa.

PLATES—Floor or Ceiling Deck
Alan Wood Steel Co., Conshohocken, Pa.

American Pressed Steel Co., Phila., Pa.
Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.

Central Iron & Steel Co., Harrisburg, Pa.
Inland Steel Co., Chicago.

PLATES—Iron or Steel
Alan Wood Steel Co., Conshohocken, Pa.

Granite City (Ill.) Steel Co.
American Rolling Mill Co., Middletown, O.

Bethlehem (Pa.) Steel Company.
Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.

Central Iron & Steel Co., Harrisburg, Pa.
Granite City (Ill.) Steel Co.

Inland Steel Co., Chicago.
Jones & Laughlin Steel Corp., Pittsburgh.

Ryerson, Joseph T. & Son, Inc., Chicago.
Tennessee Coal, Iron & Railroad Co. (U. S. Steel Corp. Subsidiary), Birmingham, Ala.

WEIRTON (W. Va.) Steel Co.
Worth Steel Co., Claymont, Del.

Youngstown (Ohio) Sheet & Tube Co., The.

PLATES—Rolled Manganese
Manganese Steel Forge Co., Phila., Pa.

PLATFORMS—Skid
Lewis-Shepard Co., 122 Walnut St., Watertown Station, Boston.

PLUGS—Core Hole
Hubbard, M. D., Spring Co., 750 Central Ave., Pontiac, Mich.



The Handiest Tool in the Shop!

That's what users say of the Canton Portable Crane. It relieves the larger cranes of the smaller jobs, and is always available where needed.

Equipped with load brake to prevent "drops."

Ask about our 30 day trial offer.

Also manufacturers of Alligator Shears and Industrial Turntables

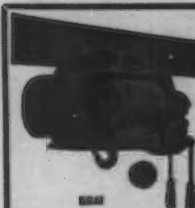
CANTON FOUNDRY & MACHINE CO.
6400 Breakwater Ave., Cleveland, Ohio

CRANES

All Types
Foundry Equipment
Special Machinery
Evaporation
Chemical Machinery
Pulverized Coal
Equipment
Stokers

WHITING CORPORATION

HARVEY-ILL. U.S.A.
(CHICAGO SUBURB)



ROBBINS & MYERS INC.

SPRINGFIELD, OHIO

ELECTRIC and HAND HOISTS—CRANES

**LOCOMOTIVE CRANES
CRAWLER CRANES
SHOVELS**

THE OHIO LOCOMOTIVE CRANE CO.
ATLANTIC CITY, N. J.

DETROIT HOIST

ELECTRIC and PNEUMATIC CAPACITIES 1/4 to 10 TONS

DETROIT HOIST & MACHINE CO.

EARLE GEARS

Cut Spur, Bevel, Herringbone and Worm Gears
All Sizes. Every Description Operating Machinery for Bridges, etc.
"Lee Simplex" Cold Metal Gears.

The Earle Gear & Machine Co.
4715 Stanton Ave.
Philadelphia, Pa.
110 State St., Boston, Mass.
86 Liberty St., New York City

Need GEARS?

SEE SIMONDS

MAXIMUM SIZES

Spur Gears	145" Dia.
Bevel & M'tro Gears	90" Dia.
Worm Gears	72" Dia.
Worms	12" Dia.
	18" Face.
	1" D.P.
	9" Face.
	3 1/2" C.P.
	30" Dia.
	4 D.P.

Racks

Internal Gears

MATERIALS

Cast Iron	
Cast Steel	
Forged Steel	
Non-Ferrous Metals	
Rawhide	
Bakelite	
All-Steel Silent Pinions	

SIMONDS

HEAT TREATED GEARS FOR SEVERE SERVICE

THE SIMONDS MANUFACTURING CO., PITTSBURGH, PA.



FALLS FRICTION CLUTCH

Pulleys and Cut-Off Couplings

And a complete line of Power Transmission Machinery • Pillow Blocks • Hangers • Couplings • Pulleys • Sheaves • Send specifications for quotation.

THE FALLS CLUTCH & MACHINERY CO.

115 Portage St., CUYAHOGA FALLS, OHIO
NEW YORK, N. Y. BOSTON, MASS.
75 Warren Street 31 Wormwood Street

R. MUNROE & Sons LEADING Mfr. of

**BOILERS TANKS & STACKS
PLATE STEEL CONSTRUCTION**

23rd St., Pittsburgh, Pa.

INDUSTRIAL HEATING ENGINEERS

DESIGNING CONSULTING CONTRACTING

Guaranteed results on recommendations for new or improved equipment--processes--methods for any heating problem.

FLINN AND DREFFEIN CO.

308 W. Washington St. Chicago, Ill.

BELMONT IRON WORKS

Engineers-Contractors-Exporters
**STRUCTURAL STEEL-BUILDINGS AND BRIDGES
RIVETED-ARC WELDED
BELMONT INTERLOCKING CHANNEL FLOOR**

Write for Catalogue

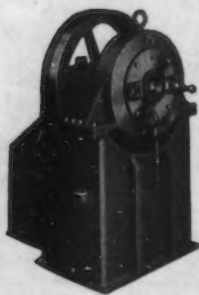
Main Office: Phila., Pa. New York Office: 44 Whitehall St.

H. A. BRASSERT & CO.

CONSULTING ENGINEERS

for Iron, Steel,
Fuel and Heavy Metallurgical Industries.
**PROJECTS, PLANT DESIGN
CONSTRUCTION, OPERATION
MARKETS, FINANCE
AND MANAGEMENT**

310 South Michigan Ave. Chicago, Ill.



THE TORRINGTON SWAGING MACHINE

—with 4000 forceful squeezing hammer blows per minute—makes metal tougher and more elastic. Send for booklet—"The Modern Art of Swaging."

THE TORRINGTON CO., Standard Plant
55 Field Street Torrington, Conn., U. S. A.

Products Index

- POLISHING & BUFFING MACHINES—Automatic**
Hammond Machinery Builders, Inc., Kalamazoo, Mich.
Packer Machine Co., The, Meriden, Conn.
- POLISHING MACHINES**
Continental Machine Specialties, Inc., Minneapolis, Minn.
Packer Machine Co., The, Meriden, Conn.
- POLISHING MACHINES—Bar**
Medart Co., The, St. Louis, Mo.
- POWER UNITS—Rotary**
New Departure Div., General Motors Corp., Bristol, Conn.
- PRECIPITATORS—Electrostatic Dust**
Pangborn Corporation, Hagerstown, Md.
- PRESS FEEDS—Automatic**
Littell, F. J., Mch. Co., Chicago.
- PRESSED METAL PARTS**
Champion Sheet Metal Co., Inc., cor. Squires & Duane Sts., Cortland, N. Y.
Crosby Co., The, Buffalo, N. Y.
Stanley Works, The, New Britain, Conn.; Bridgeport, Conn.
Whitehead Stamping Co., 1609 W. Lafayette Blvd., Detroit, Mich.
- PRESSED STEEL PARTS**
Crosby Co., The, Buffalo, N. Y.
Lansing (Mich.) Stamping Co., So. Penn Ave. Parish Pressed Steel Co., Reading, Pa.
Toledo (Ohio) Stamping & Mfg. Co.
Truscon Steel Co., Pressed Steel Div., Cleveland.
- PRESSES—Automatic**
Bliss, E. W., Co., Toledo, Ohio.
Henry & Wright Mfg. Co., The, Hartford, Conn.
Niagara Mch. & Tool Wks., Buffalo, N. Y.
V & O Press Co., Hudson, N. Y.
- PRESSES—Baling**
Galland-Henning Mfg. Co., Milwaukee.
- PRESSES—Baling, Hydraulic**
Baldwin-Southwark Corp., Southwark Div., Philadelphia.
Galland-Henning Mfg. Co., Milwaukee.
- PRESSES—Coining**
Bliss, E. W., Co., Toledo, Ohio.
Zeh & Hahnemann Co., Newark, N. J.
- PRESSES—Drop—See Hammers—Drop**
- PRESSES—Foot**
Baird Mch. Co., The, Bridgeport, Conn.
Niagara Machine & Tool Works, Buffalo, N. Y.
Waterbury (Conn.) Farrel Foundry & Machine Co., The.
- PRESSES—Forging**
Hydraulik GmbH, Duisburg, Germany.
Mesta Mch. Co., Pittsburgh.
Morgan Engineering Co., The, Alliance, O.
- PRESSES—Forming and Bending**
Cincinnati (Ohio) Shaper Co., The.
Dreis & Krump Mfg. Co., Chicago.
Niagara Mch. & Tool Wks., Buffalo, N. Y.
- PRESSES—Friction Screw**
Schatz Mfg. Co., The, Poughkeepsie, N. Y.
Zeh & Hahnemann Co., Newark, N. J.
- PRESSES—Hydraulic**
Baldwin-Southwark Corp., Southwark Div., Philadelphia.
Elmer, Chas. F., Engng. Wks., Chicago.
Farrel-Birmingham Co., Inc., Ansonia, Conn.
Hannifin Mfg. Co., Chicago.
Hydraulik GmbH, Duisburg, Germany.
Mesta Mch. Co., Pittsburgh.
Morgan Engineering Co., The, Alliance, O.
Oilgear Co., The, 1311 W. Bruce, Milwaukee.
Wood, R. D., & Co., Philadelphia.
- PRESSES—Power**
Bliss, E. W., Co., Toledo, Ohio.
Baird Mch. Co., The, Bridgeport, Conn.
Cincinnati (Ohio) Shaper Co., The.
Dreis & Krump Mfg. Co., Chicago, Ill.
Farrel-Birmingham Co., Inc., Ansonia, Conn.
Hyman, Joseph, & Sons, Phila.
Manville, E. J., Mch. Co., Waterbury, Ct.
New Albany (Ind.) Mch. Mfg. Co.
Niagara Machine & Tool Wks., Buffalo, N. Y.
Pels, Henry, & Co., Inc., 90 West St., N. Y. C.
Schatz Mfg. Co., The, Poughkeepsie, N. Y.
Standard Machinery Co., Providence, R. I.
V & O Press Co., Hudson, N. Y.
Waterbury (Ct.) Farrel Fdry. & Mch. Co., The.
Zeh & Hahnemann Co., Newark, N. J.
- PRESSES—Trimming**
Bliss, E. W., Co., Toledo, Ohio.
Erie (Pa.) Foundry Co.
Niagara Mch. & Tool Wks., Buffalo, N. Y.
- PULLEYS—Iron, Solid & Split**
Falls Clutch & Machinery Co., The, Cuyahoga Falls, Ohio.
Jones, W. A., Fdry. & Mch. Co., 4401 Roosevelt Rd., Chicago.
- PULLEYS—Magnetic**
Cutler-Hammer, Inc., Milwaukee.
- PULLEYS—Vacuum Cup**
Vacuum Cup Metal Pulley Co., Inc., Detroit, Mich.
- PULVERIZERS**
American Pulverizer Co., 1439 Macklind Ave., St. Louis, Mo.
- Jeffrey Mfg. Co., The, Columbus, Ohio.
Whitting Corp., Harvey, Ill.
- PUMPS—Acid Resisting**
Duriron Co., Inc., The, 438 N. Findlay St., Dayton, Ohio.
- PUMPS—Boiler Feed**
Aldrich Pump Co., The, Allentown, Pa.
Ingersoll-Rand Co. (Cameron), 11 Broadway, N. Y. C.
- PUMPS—Centrifugal**
Aldrich Pump Co., The, Allentown, Pa.
Fairbanks, Morse & Co., Chicago.
Ingersoll-Rand Co. (Cameron), 11 Broadway, N. Y. C.
Pennsylvania Pump & Compressor Co., Easton, Pa.
Rumsey Pump Corp., Seneca Falls, N. Y.
Ruthman Machinery Co., Cincinnati.
Tomkins-Johnson Co., The, Jackson, Mich.
Worthington Pump & Machinery Corp., Harrison, N. J.
- PUMPS—Coolant**
Ruthman Machinery Co., Cincinnati.
- PUMPS—Electric**
Fairbanks, Morse & Co., Chicago.
- PUMPS—Hydraulic**
Aldrich Pump Co., The, Allentown, Pa.
American Engineering Co., Philadelphia.
Elmer, Chas. F., Engng. Wks., Chicago.
Fairbanks, Morse & Co., Chicago.
Rumsey Pump Corp., Seneca Falls, N. Y.
Worthington Pump & Machinery Corp., Harrison, N. J.
- PUMPS—Power**
Fairbanks, Morse & Co., Chicago.
Worthington Pump & Machinery Corp., Harrison, N. J.
- PUMPS—Rotary Positive, Centrifugal & Turbine**
Crane Co., Chicago.
- PUMPS—Steam**
Fairbanks, Morse & Co., Chicago.
Ingersoll-Rand Co. (Cameron), 11 Broadway, N. Y. C.
Worthington Pump & Machinery Corp., Harrison, N. J.
- PUMPS—Vacuum**
Pennsylvania Pump & Compressor Co., Easton, Pa.
Worthington Pump & Machinery Corp., Harrison, N. J.
- PUNCHES & DIES**
Cleveland Steel Tool Co., The, 600 E. 82d St., Cleveland, Ohio.
- PUNCHING AND SHEARING MACHINES**
Beatty Mch. & Mfg. Co., 936-150th St., Hammond, Ind.
Bertsch & Co., Cambridge City, Ind.
Cincinnati (Ohio) Shaper Co., The.
Excelsior Tool & Mach. Co., E. St. Louis, Ill.
G. D. S. Shearing & Punching Machine Co., 101 Walker St., N. Y. C.
Niagara Machine & Tools Works, Buffalo, N. Y.
Pels, Henry, & Co., Inc., 90 West St., N. Y. C.
Schatz Mfg. Co., The, Poughkeepsie, N. Y.
Thomas Spacing Mach. Co., Pittsburgh.
- PYROMETERS—Indicating**
Hoskins Mfg. Co., Detroit, Mich.
Leeds & Northrup Co., Philadelphia.
- RAIL SPLICE BARS**
Ames, W., & Co., Jersey City, N. J.
- RAILS**
Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.
Foster, L. B., Co., Inc., Pittsburgh.
Frank, M. K., 480 Lexington Ave., N. Y. C.
Tennessee Coal, Iron & Railroad Co. (U. S. Steel Corp. Subsidiary), Birmingham, Ala.
- RAILS—Relaying**
Hyman-Michaels Co., Chicago.
Sherwood, E. C., 50 Church St., N. Y. C.
- RAILWAY EQUIPMENT & SUPPLIES**
Fairbanks, Morse & Co., Chicago.
- REAMERS**
Cleveland (Ohio) Twist Drill Co., The.
Greenfield (Mass.) Tap & Die Corp.
Morse Twist Drill & Mch. Co., New Bedford, Mass.
Pratt & Whitney Div. Niles-Bement-Pond Co., Hartford, Conn.
- REAMING MACHINES**
Blanchard Machine Co., The, Cambridge, Mass.
- REELS—For Coil Stock**
Littell, F. J., Mch. Co., Chicago.
- REFRACTORIES**
Babcock & Wilcox Co., The, 85 Liberty St., New York City.
Cleveland (Ohio) Quarries Co., The.
Illinois Clay Products Co., Joliet, Ill.
McClintock, Glenn R., & Co., Pittsburgh.
- REGULATORS—Compressed Gas**
Air Reduction Sales Co., 60 East 42nd St., N. Y. C.
Linde Air Prods. Co., The, 30 East 42nd St., N. Y. C.
- REINFORCEMENT FABRIC—Concrete**
Pittsburgh (Pa.) Steel Co.
Wickwire Spencer Steel Co., 41 East 42nd St., N. Y. C.

Products Index

RINGS—Iron or Steel
Midvale Co., The, Nicetown, Phila., Pa.
Standard Steel Wks. Co., Burnham, Pa.

RINGS—Welded
American Welding & Mfg. Co., Warren, O.

RIVET MAKING MACHINERY
Manville, E. J., Mch. Co., Waterbury, Ct.
Waterbury (Conn.) Farrel Foundry & Machine Co., The.

RIVET SETS
Cleveland Steel Tool Co., The, 660 E. 82d St., Cleveland, Ohio.

RIVETING MACHINES
Hannifin Mfg. Co., Chicago.
Shuster, F. B., Co., The, New Haven, Ct.

RIVETS
Blake & Johnson Co., The, Waterville, Ct.
Clark Bros. Bolt Co., Milldale, Conn.
Hassall, John, Inc., Clay & Oakland Sts., Bklyn., N. Y.
Progressive Mfg. Co., Torrington, Conn.
Russell, Burdall & Ward Bolt & Nut Co., Port Chester, N. Y.

RODS—Aluminum
Aluminum Co. of America, Pittsburgh.

RODS—Brass
American Brass Co., The, Waterbury, Conn.
Beverly Copper & Brass, Inc., 230 Park Ave., N. Y. C.

RODS—Magnesium Alloys
Dow Chemical Co., The, 921 Jefferson Ave., Midland, Mich.

RODS—Nickel Silver
American Brass Co., The, Waterbury, Conn.
Riverside (N. J.) Metal Co.
Seymour (Conn.) Mfg. Co.

RODS—Phosphor Bronze
American Brass Co., The, Waterbury, Conn.
Phosphor Bronze Smelting Co., The, Phila.
Beverly Copper & Brass, Inc., 230 Park Ave., N. Y. C.
Riverside (N. J.) Metal Co.
Seymour (Conn.) Mfg. Co.

RODS—Welding
Air Reduction Sales Co., 60 East 42nd St., N. Y. C.
American Brass Co., The, Waterbury, Conn.
American Steel & Wire Co. (U. S. Steel Corp. Subsidiary), Chicago.
Electric Arc Cutting & Welding Co., The, Newark, N. J.
Harnischfeger Corp., 4401 W. National Ave., Milwaukee.
Lincoln Electric Co., The, Cleveland.
Linde Air Prods. Co., The, 30 East 42nd St., N. Y. C.
Pittsburgh (Pa.) Steel Co.
Revere Copper & Brass, Inc., 230 Park Ave., N. Y. C.
Una Welding, Inc., Cleveland, Ohio.
Wilson Welder & Metals Co., Inc., 60 E. 42nd St., New York City.

RODS—Wire
American Steel & Wire Co. (U. S. Steel Corp. Subsidiary), Chicago.
Bethlehem (Pa.) Steel Co.
Jones & Laughlin Steel Corp., Pittsburgh.
Pittsburgh (Pa.) Steel Co.
Wickwire Brothers, Cortland, N. Y.
Wickwire Spencer Steel Co., 41 East 42nd St., N. Y. C.
Youngstown (Ohio) Sheet & Tube Co., The.

ROLLING MACHINERY—Cold Rolling
Bliss, E. W., Co., Toledo, Ohio.
Cold Metal Process Co., The, Youngstown, Ohio.
Lewis Foundry & Mch. Co., Pittsburgh.
United Engineering & Fdry. Co., Pgh.

ROLLING MACHINERY—Sheet Metal
Lewis Foundry & Mch. Co., Pittsburgh.

ROLLING MILL MACHINERY
Aetna-Standard Engineering Co., The, Youngstown, Ohio.
Bliss, E. W., Co., Toledo, Ohio.
Cold Metal Process Co., The, Youngstown, Ohio.

Farrel-Birmingham Co., Inc., Ansonia, Ct.
Hyde Park (Pa.) Fdry. & Mch. Co.
Lewis Foundry & Mch. Co., Pittsburgh.
Mesta Mch. Co., Pittsburgh.
Morgan Construction Co., Worcester, Mass.
Morgan Engineering Co., The, Alliance, O.
National Roll & Fdry. Co., Avonmore, Pa.
Standard Machinery Co., Providence, R. I.
United Engineering & Fdry. Co., Pgh.
Waterbury (Ct.) Farrel Fdry. & Mch. Co., The.

ROLLS—Alloy Steel
Pittsburgh (Pa.) Rolls Corp.

ROLLS—Bending and Straightening
Baldwin-Southwark Corp., Southwark Div., Philadelphia.
Berthel & Co., Cambridge City, Ind.
Kane & Roach, Inc., Syracuse, New York.
Niagara Machine & Tool Works, Buffalo, N. Y.
Schatts Mfg. Co., The, Poughkeepsie, N. Y.

ROLLS—Rubber Covered
Manhattan Rubber Mfg. Div. of Raybestos-Manhattan, Inc., The, 2 Townsend St., Passaic, N. J.

ROLLS—Sand Chilled Iron and Steel
Aetna-Standard Engineering Co., The, Youngstown, Ohio.
Hyde Park (Pa.) Fdry. & Mch. Co.

Lewis Foundry & Mch. Co., Pittsburgh.
Mackintosh-Hemphill Co., Pittsburgh.
Mesta Mch. Co., Pittsburgh.
National Roll & Fdry. Co., Avonmore, Pa.
Pittsburgh (Pa.) Rolls Corp.
United Engineering & Fdry. Co., Pgh.

ROLLS—Special Hardened
Midvale Co., The, Nicetown, Phila., Pa.

ROOFING—Special Copper Bearing Steel
Newport (Ky.) Rolling Mill Co., The.
Superior Sheet Steel Co., Canton, Ohio.

ROOFING AND SIDING—Corrugated and Plain
American Rolling Mill Co., Middletown, O.
Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.
Johns-Manville Corp., 22 East 40th St., New York City.
Newport (Ky.) Rolling Mill Co., The.
Weirton (W. Va.) Steel Co.
Youngstown (Ohio) Sheet & Tube Co., The.

ROOFING AND SIDING—Genuine Open Hearth Iron
Newport (Ky.) Rolling Mill Co.

ROOFING AND SIDING—Iron and Steel
Inland Steel Co., Chicago.
Newport (Ky.) Rolling Mill Co., The.

ROOFING AND SIDING—(Zinc)—Corrugated & Plain
New Jersey Zinc Co., The, 160 Front St., N. Y. C.

ROOFING MATERIALS
Carey, Philip, Co., The, Cincinnati.

RUBBER LININGS
Goodrich, B. F., Co., The, Akron, Ohio.
Goodyear Tire & Rubber Co., Akron, Ohio.

RUBBER MOLDED PARTS
Goodyear Tire & Rubber Co., Akron, Ohio.
Manhattan Rubber Mfg. Div. of Raybestos-Manhattan, Inc., The, 2 Townsend St., Passaic, N. J.
Richardson Co., The, Melrose Park, Ill.

RUST PREVENTIVES
American Chemical Paint Co., Ambler, Pa.
American Lanolin Corp., Lawrence, Mass.
Parker Rust-Proof Co., 2186 Milwaukee Ave., Detroit.

RUST PROOFING COMPOUNDS
Parker Rust-Proof Co., 2186 Milwaukee Ave., Detroit.

RUST PROOFING PROCESS
American Chemical Paint Co., Ambler, Pa.
Parker Rust-Proof Co., 2186 Milwaukee Ave., Detroit.
Udylite Co., The, Detroit.

RUST REMOVING
Nukem Products Corp., 68 Niagara St., Buffalo, N. Y.

SAND BLAST EQUIPMENT AND MACHINES
American Foundry Equipment Co., The, 401 Byrkit St., Mishawaka, Ind.
Pangborn Corporation, Hagerstown, Md.

SAND BLAST STEEL SHOT
American Foundry Equipment Co., The, 401 Byrkit St., Mishawaka, Ind.
Pittsburgh (Pa.) Crushed Steel Co.

SAND HANDLING EQUIPMENT
Bartlett, C. O., Snow Co., The, Cleveland.
Jeffrey Mfg. Co., The, Columbus, Ohio.

SAWING MACHINES—Metal
Eppen-Lucas Mch. Works, Phila.
Heller Machine Co., 114 Liberty St., N. Y. C.
Peerless Mch. Co., Racine, Wis.

SAWING MACHINES—Metal-Band
Continental Machine Specialties, Inc., Minneapolis, Minn.

SAWS—Band and Hack for Metal
Armstrong-Blum Mfg. Co., Chicago.
Atkins, E. C., & Co., Indianapolis.
Disston, Henry, & Sons, Inc., Philadelphia.
Wells Mfg. Corp., Three Rivers, Mich.

SAWS—Circular, Rip & Cutoff
Atkins, E. C., & Co., Indianapolis.

SAWS—Friction
Atkins, E. C., & Co., Indianapolis.
Disston, Henry, & Sons, Inc., Philadelphia.

SAWS—Hack Saw Blades
Atkins, E. C., & Co., Indianapolis.
Peerless Mch. Co., Racine, Wis.
Starrett, L. S., Co., Athol, Mass.

SAWS—Hot Metal
Atkins, E. C., & Co., Indianapolis.
Disston, Henry, & Sons, Inc., Philadelphia.

SAWS—Inserted Teeth, Cold
Disston, Henry, & Sons, Inc., Philadelphia.
Tabor Mfg. Co., Philadelphia.

SAWS—Milling
Atkins, E. C., & Co., Indianapolis.
Disston, Henry, & Sons, Inc., Philadelphia.

SCALES
Exact Weight Scale Co., Columbus, Ohio.
Fairbanks, Morse & Co., Chicago.

SCREENS—Manganese Steel
Manganese Steel Forge Co., Phila., Pa.

SCREENS—Perforated Metal
Chicago Perforating Co., 2440 W. 24th Pl., Chicago, Ill.

IMPROVED UNIVERSAL SPRING COILING MACHINES

FOUR SIZES NOW READY
"THE THREE IN ONE MACHINE"

WRITE FOR COMPLETE INFORMATION

SLEEPER & HARTLEY, INC.
WORCESTER, MASSACHUSETTS

WIRE AND METAL RIBBON
FORMING MACHINERY
NILSON TILTING
WIRE REELS
(Wire Reel Catalog No. 51)
Special Machines Designed and Built to Order
THE A. H. NILSON MACHINE COMPANY, BRIDGEPORT, CONN.

MOORE RAPID
LECTROMELT FURNACES
For the rapid and economic melting and refining of gray and malleable irons, carbon and alloy steels, etc.
PITTSBURGH LECTROMELT FURNACE CORPORATION
P. O. Box 1257
Pittsburgh, Pa.

FOR YOUR FREE COPY OF FLASHES
TO RECEIVE EACH MONTH A FREE COPY OF FLASHES, THE MAGAZINE DEVOTED TO THE LATEST RESISTANCE WELDING NEWS, IDEAS AND INFORMATION, CUT OUT THIS CARD, CLIP IT TO YOUR LETTERHEAD AND MAIL IT TO
THOMSON-GIBB ELECTRIC WELDING CO.
LYNN, MASSACHUSETTS

ROLL LATHES
The Hyde Park kind are manufactured from correctly made castings of heavy and rigid construction and built to last many years. Handled by an experienced mill man. Tell us when you expect to place your next order.
ROLLS (Sand and Chilled) ROLL LATHES
IRON CASTINGS, TIN PLATE MACHINERY
HYDE PARK FOUNDRY & MACHINE CO.
HYDE PARK (Conemaugh Div. P. R. R.) PA.

PIPE and TUBE FITTINGS
for OIL, GAS, AIR or WATER
Made from hot forgings, extruded rod and castings to connect brass and copper tubing.
Write for Catalog I-30.
COMMONWEALTH BRASS CORPORATION
DETROIT

SINCE 1840
RUMSEY PUMPS
FOR ALL PURPOSES
RUMSEY PUMP CORP., SENECA FALLS, N. Y.

Fifty Years' Experience at your Beck and Call

Without any price premium . . . you can draw on Hendrick's experience . . . over fifty years of it . . . working on every conceivable kind of perforated metal. Why shouldn't you make use of it?

During that time Hendrick has solved many a difficult problem and is better situated today than ever before to handle not only your special jobs but also your regular requirements of standard perforated metals.

HENDRICK MFG. CO.

37 Dundaff Street, Carbondale, Pa.

SALES OFFICES IN PRINCIPAL CITIES
PLEASE CONSULT TELEPHONE DIRECTORY

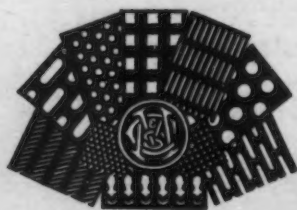
Manufacturers of Miteo Open Steel Flooring; Elevator Buckets; Light and Heavy Steel Plate Construction

MUNDT PERFORATED METALS

The few perforations illustrated are indicative of the wide variety of our line—we can perforate almost any size perforation in any kind of metal or material required. Send us your specifications.

Sixty-seven years of manufacturing perforated metals for every conceivable purpose assure satisfaction.

Write for Catalog of Patterns



TIN, STEEL, COPPER, ALUMINUM, BRONZE,
BRASS, ZINC, ANY METAL, ANY PURPOSE

CHARLES MUNDT & SONS
59 FAIRMOUNT AVE., JERSEY CITY, N. J.

Products Index

Diamond Mfg. Co., Wyoming, Pa.
Erdie Perforating Co., Rochester, N. Y.
Harrington & King Perforating Co., Chicago

Hendrick Mfg. Co., Carbondale, Pa.
Mundt, Chas., & Sons, 59 Fairmount Ave., Jersey City, N. J.

SCREENS—Woven Wire
Michigan Wire Cloth Co., 2117 Howard St., Detroit.

Wickwire Brothers, Cortland, N. Y.
Wickwire Spencer Steel Co., 41 East 42nd St., N. Y. C.

SCREW MACHINE PRODUCTS
Barnes, Wallace Co., The, Div. of Associated Spring Corp., Bristol, Conn.

Blake & Johnson Co., The, Waterville, Ct.
Commonwealth Brass Corp., Detroit.

Eastern Mch. Screw Corp., New Haven.
Houde Engineering Corp., Buffalo, N. Y.
National Acme Co., The, Cleveland.

New Britain-Gridley Machine Div., The
New Britain Machine Co., New Britain, Conn.

Olson Mfg. Co., Worcester, Mass.
Ottemiller, Wm. H., Co., Inc., York, Pa.

Peck Spring Co., The, Plainville, Conn.
Progressive Mfg. Co., Torrington, Conn.

Screw Mch. Products Corp., Prov., R. I.
SCREW MACHINERY—Automatic
Cone Automatic Mach. Co., Inc., Windsor, Vt.

National Acme Co., The, Cleveland.
New Britain-Gridley Machine Div., The
New Britain Machine Co., New Britain, Conn.

SCREW MACHINERY—Hand
Warner & Swasey Co., The, Cleveland.

SCREW MACHINERY—Multiple Spindle
Acme Machine Tool Co., Cincinnati.

Cone Automatic Mach. Co., Inc., Windsor, Vt.
National Acme Co., The, Cleveland.

SCREW PLATES
Greenfield (Mass.) Tap & Die Corp.

SCREW STOCK
Bliss & Laughlin, Inc., Harvey, Ill.
Union Drawn Steel Co., Massillon, Ohio.

SCREWS—Cap
Cleveland (Ohio) Cap Screw Co., The.
National Acme Co., The, Cleveland.

Ottemiller, Wm. H., Co., Inc., York, Pa.
SCREWS—Coarse or Lag
Lamson & Sessions Co., The, Cleveland.

SCREWS—Machine
Blake & Johnson Co., The, Waterville, Ct.
Progressive Mfg. Co., The, Torrington, Ct.

SCREWS—Safety Set
Progressive Mfg. Co., The, Torrington, Ct.
Standard Pressed Steel Co., Jenkintown, Pa.

SCREWS—Set
Cleveland (Ohio) Cap Screw Co., The.
National Acme Co., The, Cleveland.

Ottemiller, Wm. H., Co., Inc., York, Pa.
SCREWS, Socket, Head, Cap
Standard Pressed Steel Co., Jenkintown, Pa.

SCREWS—Thumb
Parker-Kalon Corp., 196 Varick St., N. Y.

SCRUBBING MACHINES—Sheet
Wean Engineering Co., Inc., The, Warren, Ohio.

SCYTHE STONES AND WHETSTONES
Carborundum Co., The, Niagara Falls, N. Y.

SECOND-HAND MACHINERY—(See Clearing House Section)

SEPARATORS—Magnetic
Dings Magnetic Separator Co., Milwaukee, Ohio.

Ohio Electric Mfg. Co., The, 5908 Maurice Ave., Cleveland.

Stearns Magnetic Mfg. Co., 635 So. 28th St., Milwaukee.

SHAFTING—Cold Drawn
Union Drawn Steel Co., Massillon, Ohio.

Wyckoff Drawn Steel Co., Pittsburgh, Pa.

SHAFTING—Steel
Bliss & Laughlin, Inc., Harvey, Ill.

Union Drawn Steel Co., Massillon, Ohio.

SHAFTING—Turned and Ground
Bliss & Laughlin, Inc., Harvey, Ill.

Ryerson, Jos. T., & Son, Inc., Chicago.
Union Drawn Steel Co., Massillon, Ohio.

Wyckoff Drawn Steel Co., Pittsburgh, Pa.

SHAPERS
Cincinnati (Ohio) Shaper Co., The.

SHAPERS—Vertical
Pratt & Whitney Div. Niles-Bement-Pond Co., Hartford, Conn.

SHAPES—Cold Drawn
Bliss & Laughlin, Inc., Harvey, Ill.

Union Drawn Steel Co., Massillon, Ohio.
Wyckoff Drawn Steel Co., Pittsburgh, Pa.

SHAPES—Wire
Cuyahoga Spring Co., The, Cleveland.

Eastern Tool & Mfg. Co., Bloomfield, N. J.
Lee Spring Co., Inc., 30 Main St., Brooklyn, N. Y.

Reebing's, John A. Sons Co., Trenton, N. J.

SHEAR BLADES & KNIVES
American Shear Knife Co., Homestead, Pa.

Heppenstall Co., Pittsburgh.

SHEARING MACHINES—Alligator
Canton Fdry. & Mch. Co., Cleveland.

SHEARING MACHINES—Angle, Hand and Power
Federal Bearings Co., Inc., The, Poughkeepsie, N. Y.

SHEARING MACHINES—Beam and Channel
Schatz Mfg. Co., The, Poughkeepsie, N. Y.

United Engineering & Fdry. Co., Pgh.

SHEARING MACHINES—Billet
Morgan Engineering Co., The, Alliance, O.

Peis, Henry, & Co., Inc., 90 West St., N. Y. C.

Schatz Mfg. Co., The, Poughkeepsie, N. Y.

United Engineering & Fdry. Co., Pgh.

SHEARING MACHINES—Continuous Sheet & Pack
Aetna-Standard Engineering Co., The, Youngstown, Ohio.

SHEARING MACHINES—Plate
Bertch & Co., Cambridge City, Ind.

Cincinnati (Ohio) Shaper Co., The.

Dreis & Krump Mfg. Co., Chicago.

Mesta Mch. Co., Pittsburgh.

Morgan Engineering Co., The, Alliance, O.

Niagara Machine & Tool Works, Buffalo, N. Y.

Peis, Henry, & Co., Inc., 90 West St., N. Y. C.

Schatz Mfg. Co., The, Poughkeepsie, N. Y.

United Engineering & Fdry. Co., Pgh.

SHEARING MACHINES—Sheet and Plate
Beatty Mch. & Mfg. Co., 936-150th St., Hammond, Ind.

Cincinnati (Ohio) Shaper Co., The.

Dreis & Krump Mfg. Co., Chicago.

Niagara Mach. & Tool Wks., Buffalo, N. Y.

SHEARING MACHINES—Squaring
Cincinnati (Ohio) Shaper Co., The.

Dreis & Krump Mfg. Co., Chicago.

Niagara Mach. & Tool Wks., Buffalo, N. Y.

SHEARS—Hand for Sheet Metal
Bremil Mfg. Co., Erie, Pa.

SHEAVES—V-Belt—Cast Iron
Lindero Machine & Tool Co., Detroit.

SHEET BARS
Andrews Steel Co., The, Newport, Ky.

Jones & Laughlin Steel Corp., Pittsburgh.

SHEET METAL MACHINERY
Bliss, E. W. Co., Toledo, Ohio.

Cincinnati (Ohio) Shaper Co., The.

Dreis & Krump Mfg. Co., Chicago.

Kane & Roach, Inc., Syracuse, New York.

New Albany (Ind.) Mch. Mfg. Co.

Niagara Mach. & Tool Wks., Buffalo, N. Y.

V & O Press Co., Hudson, N. Y.

Waterbury (Conn.) Farrel Foundry & Machine Co., The.

SHEETS—Aluminum
Aluminum Co. of America, Pittsburgh.

SHEETS—Auto Body
American Rolling Mill Co., Middletown, O.

Bethlehem (Pa.) Steel Co.

Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.

Inland Steel Co., Chicago.

Republic Steel Corp., Cleveland, Ohio.

Youngstown (Ohio) Sheet & Tube Co., The.

SHEETS—Black
American Rolling Mill Co., Middletown, O.

Bethlehem (Pa.) Steel Co.

Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.

Columbia Steel Co. (U. S. Steel Corp. Subsidiary), San Francisco, Calif.

Granite City (Ill.) Steel Co.

Ingersoll Steel & Disc Co., Chicago.

Inland Steel Co., Chicago.

Newport (Ky.) Rolling Mill Co., The.

Republic Steel Corp., Cleveland, Ohio.

Ryerson, Jos. T., & Son, Inc., Chicago.

Scully Steel Products Co. (U. S. Steel Corp. Subsidiary), Chicago.

Tennessee Coal, Iron & Railroad Co. (U. S. Steel Corp. Subsidiary), Birmingham, Ala.

Weirton (W. Va.) Steel Co.

SHEETS—Blue Annealed
Alan Wood Steel Co., Conshohocken, Pa.

American Rolling Mill Co., Middletown, O.

Bethlehem (Pa.) Steel Co.

Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.

Central Iron & Steel Co., Harrisburg, Pa.

Granite City (Ill.) Steel Co.

Great Lakes Steel Corp., Detroit.

Newport (Ky.) Rolling Mill Co., The.

Ryerson, Jos. T., & Son, Inc., Chicago.

Weirton (W. Va.) Steel Co.

SHEETS—Brass, Bronze, Copper, Nickel, Silver or Phosphor Bronze
American Brass Co., The, Waterbury, Conn.

Phosphor Bronze Smelting Co., The, Phila.

Revere Copper & Brass, Inc., 230 Park Ave., N. Y. C.

Riverside (N. J.) Metal Co.

Seymour (Conn.) Mfg. Co.

SHEETS—Chrome
Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.

SHEETS—Chrome Nickel
Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.

SHEETS—Cold Rolled
American Rolling Mill Co., Middletown, O.

Bethlehem (Pa.) Steel Co.

Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.

Great Lakes Steel Corp., Detroit.

Inland Steel Co., Chicago.

Republic Steel Corp., Cleveland, Ohio.

Ryerson, Jos. T., & Son, Inc., Chicago.

Weirton (W. Va.) Steel Co.

Products Index

SHEETS—Copper Alloy
American Brass Co., The Waterbury, Conn.

SHEETS—Copper Steel
Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.

Inland Steel Co., Chicago.
Newport (Ky.) Rolling Mill Co., The.

SHEETS—Electrical
American Rolling Mill Co., Middletown, O.
Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.

Newport (Ky.) Rolling Mill Co., The.
Republic Steel Corp., Cleveland, Ohio.

SHEETS—Enameling
American Rolling Mill Co., Middletown, O.
Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.

Columbia Steel Co. (U. S. Steel Corp. Subsidiary), San Francisco, Calif.
Great Lakes Steel Corp., Detroit.
Inland Steel Co., Chicago.
Newport (Ky.) Rolling Mill Co., The.

SHEETS—For Drawing and Stamping
American Rolling Mill Co., Middletown, O.
Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.

Newport (Ky.) Rolling Mill Co., The.
Republic Steel Corp., Cleveland, Ohio.
Ryerson, Jos. T., & Son, Inc., Chicago.
Superior Sheet Steel Co., Canton, Ohio.
Worth Steel Co., Claymont, Del.

SHEETS—Full Finished
Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.

Newport (Ky.) Rolling Mill Co., The.
Republic Steel Corp., Cleveland, Ohio.
Youngstown (Ohio) Sheet & Tube Co., The.

SHEETS—Galvanized, Flat and Corrugated
American Rolling Mill Co., Middletown, O.
Bethlehem (Pa.) Steel Co.
Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.

Columbia Steel Co. (U. S. Steel Corp. Subsidiary), San Francisco, Calif.
Continental Steel Corp., Kokomo, Ind.
Granite City (Ill.) Steel Co.
Inland Steel Co., Chicago.
Newport (Ky.) Rolling Mill Co., The.
Republic Steel Corp., Cleveland, Ohio.
Ryerson, Jos. T., & Son, Inc., Chicago.
Tennessee Coal, Iron & Railroad Co. (U. S. Steel Corp. Subsidiary), Birmingham, Ala.

Weirton (W. Va.) Steel Co.
Youngstown (Ohio) Sheet & Tube Co., The.
SHEETS—Long Term
Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.

Newport (Ky.) Rolling Mill Co., The.
Weirton (W. Va.) Steel Co.

SHEETS—Magnesium Alloys
Dow Chemical Co., The, 921 Jefferson Ave., Midland, Mich.

SHEETS—Metal Furniture
Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.

Newport (Ky.) Rolling Mill Co., The.
Republic Steel Corp., Cleveland, Ohio.

SHEETS—Picked
Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.

Newport (Ky.) Rolling Mill Co., The.
SHEETS—Tin Mill Black
American Rolling Mill Co., Middletown, O.

Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.

Newport (Ky.) Rolling Mill Co., The.

SHEETS—Zinc
New Jersey Zinc Co., The, 160 Front St., Newark, N. J.

SHELVING—Steel
Frick-Gallagher Mfg. Co., The, Weirton, Ohio.

SHOP FURNITURE
New Britain-Gridley Machine Div., The.
New Britain Machine Co., New Britain, Conn.

SHUTTERS—Steel & Wood Bi-Folding
Kinnear Mfg. Co., Columbus, Ohio.

SILICO-MANGANESE
Electro Metallurgical Sales Corp., 30 E. 42nd St., N. Y. C.

SILICON METAL & ALLOYS
Electro Metallurgical Sales Corp., 30 E. 42nd St., N. Y. C.

SLABS
Andrews Steel Co., The, Newport, Ky.

SLINGS—Wire Rope
Hoebbing's, John A., Sons Co., Trenton, N. J.

SLOTING MACHINES
Nazel Engineering & Machine Works, Philadelphia.

SOLVENTS—Oil & Grease
Detroit Rex Products Co., Detroit, Mich.

SPACING TABLES—Pushing & Shearing
Thomas Spacing Mach. Co., Pittsburgh.

SPECIAL MACHINERY
Baldwin-Southwark Corp., Southwark Div., Philadelphia.

Bullard Co., The, Bridgeport, Conn.
Eastern Tool & Mfg. Co., Bloomfield, N. J.

Houdt Engineering Corp., Buffalo, N. Y.
Manville, E. J., Mch. Co., Waterbury, Ct.

Morgan Engineering Co., The, Alliance, O.
National Rubber Machinery Co., Clifton, N. J.

Taft-Pelree Mfg. Co., The, Woonsocket, R. I.

Wood, R. D., & Co., Philadelphia.

SPECIALTIES—Rubber Covered & Lined
Goodrich, B. F., Co., The, Akron, Ohio.

SPEED REDUCERS
Boston Gear Wks., Inc., North Quincy, Mass.

Cleveland (Ohio) Worm & Gear Co.
Hornburgh & Scott Co., 5112 Hamilton Ave., Cleveland.

James, D. O., Mfg. Co., Chicago.
Jones, W. A., Fdry. & Mch. Co., 4401 Roosevelt Rd., Chicago.

Link-Belt Co., Chicago.
Morris Chain Co., Ithaca, New York.

Philadelphia (Pa.) Gear Works.

SPIEGELEISEN
Electro Metallurgical Sales Corp., 30 E. 42nd St., N. Y. C.

SPIKES—Screw
Oliver Iron & Steel Corp., Pittsburgh.

SPIKES—Track
Ames, W., & Co., Jersey City, N. J.
Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.

Weirton (W. Va.) Steel Co.

SPINDLES—Grinding
Ex-Cell-O Corp., 1200 Oakman Blvd., Detroit.

SPINDLES—Hollow Bored
American Hollow Boring Co., 1912 Raspberry St., Erie, Pa.

SPICE BARS
Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.

SPRAY FINISHING EQUIPMENT
DeVilbiss Co., The, Toledo, Ohio.

SPRAYERS—Paint
DeVilbiss Co., The, Toledo, Ohio.

SPRING MAKING MACHINERY
Baird Mch. Co., The, Bridgeport, Conn.

Sleeper & Hartley, Inc., Worcester, Mass.

SPRINGS—Car
Miller & Van Winkle, Inc., 18 Bridge St., Brooklyn, N. Y.

SPRINGS—Extension, Compression, Torsion or Flat
Amer. Spring & Mfg. Corp., Holly, Mich.

American Steel & Wire Co. (U. S. Steel Corp. Subsidiary), Chicago.

Barnes-Gibson-Raymond, Detroit Plant, Div. of Associated Spring Corp.

Barnes, Wallace Co., The, Div. of Associated Spring Corp., Bristol, Conn.

Cook Plant of Barnes-Gibson-Raymond, Div. of Associated Spring Corp., Ann Arbor, Mich.

Cuyahoga Spring Co., The, Cleveland.
Dunbar Bros. Co., Div. of Associated Spring Corp., Bristol, Conn.

Gibson, Wm. D., Co., Div. of Associated Spring Corp., Chicago.

Hubbard, M. D., Spring Co., 750 Central Ave., Pontiac, Mich.

Lee Spring Co., Inc., 30 Main St., Brooklyn, N. Y.

Miller & Van Winkle, Inc., 18 Bridge St., Brooklyn, N. Y.

Peck Spring Co., The, Plainville, Conn.
Raymond Mfg. Co., Div. of Associated Spring Corp., Corry, Pa.

U. S. Steel Wire Spring Co., Cleveland, O.
Wickwire Spencer Steel Co., 41 East 42nd St., N. Y. C.

SPROCKETS
Baldwin-Duckworth Chain Corp., Springfield, Mass.

Boston Gear Wks., Inc., North Quincy, Mass.

Diamond Chain & Mfg. Co., Indianapolis, Ind.

Morse Chain Co., Ithaca, New York.
Whitney Chain & Mfg. Co., Hartford, Ct.

STAMPINGS OR DRAWINGS—Metal
Barnes-Gibson-Raymond, Detroit Plant, Div. of Associated Spring Corp.

Barnes, Wallace Co., The, Div. of Associated Spring Corp., Bristol, Conn.

Central Iron & Steel Co., Harrisburg, Pa.
Champion Sheet Metal Co., Inc., cor. Squires & Duane Sts., Corland, N. Y.

Cook Plant of Barnes-Gibson-Raymond, Div. of Associated Spring Corp., Ann Arbor, Mich.

Crosby Co., The, Buffalo, N. Y.
Dayton Rogers Mfg. Co., Minneapolis, Minn.

Dunbar Bros. Co., Div. of Associated Spring Corp., Bristol, Conn.

E. S. M. C. O. Auto Products Corp., Bush Terminal Bldg., 27, Bklyn., N. Y.

Eastern Tool & Stpg. Co., Inc., Saugus, Mass.
Gibson, Wm. D., Co., Div. of Associated Spring Corp., Chicago.

Hubbard, M. D., Spring Co., 750 Central Ave., Pontiac, Mich.
Lansing (Mich.) Stamping Co., So. Penn. Ave.

Lee Spring Co., Inc., 30 Main St., Brooklyn, N. Y.

Miller & Van Winkle, Inc., 18 Bridge St., Brooklyn, N. Y.

Parish Pressed Steel Co., Reading, Pa.
Raymond Mfg. Co., Div. of Associated Spring Corp., Corry, Pa.

Sessions, J. H., & Son, Bristol, Conn.

Toledo (Ohio) Stamping & Mfg. Co.

Torrington (Conn.) Company



● America was young industrially when Jarecki produced its first valves nearly a century ago. While the nation grew Jarecki kept pace. And always Jarecki has clung to this ideal: Build extra strength into valves and they'll give extra service. Today Jarecki Valves are standard throughout the world. A complete variety of sizes and models is available.

JARECKI MANUFACTURING CO., Erie, Pa., U. S. A.

COMPRESSED AIR

Your Guarantee of a Thrifty, Dependable Air or Gas Compressor is the Word

SULLIVAN

on the name plate

Sizes from ten to fifteen hundred horse power are available, a type for every need of industry.

SULLIVAN MACHINERY COMPANY

Michigan City, Ind.

NEW YORK CITY

CHICAGO

SCREW MACHINE PRODUCTS



CAP AND SET SCREWS

WM. H. OTTEMILLER CO., Inc.
Pattison St., & M. & P.R. York, Pa.

SCREW MACHINE PRODUCTS
ACCURATELY MADE AT A FAIR PRICE
ARE MORE ECONOMICAL


Specialists in the production of screw machine products for 15 years. Let us quote on your requirements.
Screw Machine Products Corp., 1014 Eddy St., Providence, R.I.

PARKER-KALON Cold-forged
WING NUTS & THUMB SCREWS



Made by a new and improved process. Neater, stronger—yet cost no more!

Compare—get prices and samples from Parker-Kalon Corp., 200 Varick St. New York



UNBRAKO

FREE SAMPLES FOR DOUBTING THOMASES DEALERS EVERYWHERE—PROMPT DELIVERIES

STANDARD PRESSED STEEL CO.
Box 523 Jenkintown, Pa.



NAILS, RIVETS & SCREWS MADE TO ORDER IN ANY METAL

JOHN HASSALL, INC. EST. 1850 CLAY & OAKLAND STS. BROOKLYN, N.Y.

Quality BOLT & NUT HARDWARE Since 1921
LOCK WASHERS—COTTER PINS—CAP SCREWS—STOVE BOLTS—NUTS, ETC.



HEIZ & HEIZ, INC. MFGRS. 33-34TH STREET BROOKLYN, NEW YORK



TO TEST THE HARDNESS

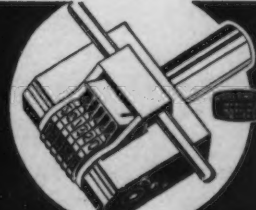
of Materials Properly, The Instrument Must Technically Fit the Work. Our Line is adapted to test all classes of materials. Preferred and used the world over by the leading firms. 100% Portable, rapid, accurate. We can save you money. Send for interesting bulletins free.

THE SHORE INSTRUMENT & MFG. CO.
JAMAICA, NEW YORK

FOR ECONOMY

Use a "Noblewest" precision-built automatic numbering head. A quality marking tool of rugged construction. Can be used to number both flat and round metal articles with speed and accuracy. Machine or hand operated.

THE NOBLE & WESTBROOK MFG. CO.
EAST HARTFORD CONNECTICUT



Products Index

Truscon Steel Co., Pressed Steel Div., Cleveland.
Whitehead Stamping Co., 1669 W. Lafayette Blvd., Detroit, Mich.
Worcester (Mass.) Stamped Metal Co.
STAMPS—Steel Alphabets and Figures
Cunningham, M. E. Co., Pittsburgh.
Noble & Westbrook Mfg. Co., The, East Hartford, Ct.
STAPLES—Wire
Wickwire Brothers, Cortland, N. Y.
STEEL—Acid Resisting
Duriron Co., Inc., The, 438 N. Findlay St., Dayton, Ohio.
STEEL—Alloy
Alan Wood Steel Co., Conshohocken, Pa.
Andrews Steel Co., The, Newport, Ky.
Bethlehem (Pa.) Steel Company.
Bissett Steel Co., The, Cleveland.
Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.
Carpenter Steel Co., The, 121 W. Bern St., Reading, Pa.
Harrisburg (Pa.) Steel Corp.
Ingersoll Steel & Disc Co., Chicago.
Jessop Steel Co., Washington, Pa.
Latrobe (Pa.) Electric Steel Co.
Ludlum Steel Co., Watervliet, N. Y.
Republic Steel Corp., Cleveland, Ohio.
Ryerson, Jos. T., & Son, Inc., Chicago.
Tennessee Coal, Iron & Railroad Co. (U. S. Steel Corp. Subsidiary), Birmingham, Ala.
Timken Roller Bearing Co., The, Canton, O.
Timken Steel & Tube Div., The Timken Roller Bearing Co., Canton, O.
Vanadium-Alloys Steel Co., Latrobe, Pa.
Wheelock, Lovejoy & Co., Inc., Cambridge, Mass.
STEEL—Alloy, Cold Drawn
Bliss & Laughlin, Inc., Harvey, Ill.
Union Drawn Steel Co., Massillon, Ohio.
Wheelock, Lovejoy & Co., Inc., Cambridge, Mass.
Wyckoff Drawn Steel Co., Pittsburgh, Pa.
STEEL—Bright Finished
Bliss & Laughlin, Inc., Harvey, Ill.
Union Drawn Steel Co., Massillon, Ohio.
STEEL—Carbon
Andrews Steel Co., The, Newport, Ky.
Bethlehem (Pa.) Steel Co.
Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.
Harrisburg (Pa.) Steel Corp.
Ingersoll Steel & Disc Co., Chicago.
Latrobe (Pa.) Electric Steel Co.
STEEL—Carbon Vanadium
Andrews Steel Co., The, Newport, Ky.
Latrobe (Pa.) Electric Steel Co.
STEEL—Chrome
Andrews Steel Co., The, Newport, Ky.
Carpenter Steel Co., The, 121 W. Bern St., Reading, Pa.
Latrobe (Pa.) Electric Steel Co.
STEEL—Chrome Manganese
Latrobe (Pa.) Electric Steel Co.
STEEL—Chrome Nickel
Andrews Steel Co., The, Newport, Ky.
Harrisburg (Pa.) Steel Corp.
Latrobe (Pa.) Electric Steel Co.
STEEL—Chrome Nickel Silver
Ingersoll Steel & Disc Co., Chicago.
STEEL—Chrome Vanadium
Andrews Steel Co., The, Newport, Ky.
Harrisburg (Pa.) Steel Corp.
Latrobe (Pa.) Electric Steel Co.
STEEL—Cobalt
Darwin & Milner, Inc., Cleveland.
STEEL—Cold Drawn
Bliss & Laughlin, Inc., Harvey, Ill.
Jones & Laughlin Steel Corp., Pittsburgh.
Latrobe (Pa.) Electric Steel Co.
Rathbone, A. B. & J., Palmer, Mass.
Ryerson, Joseph T., & Son, Inc., Chicago.
Union Drawn Steel Co., Massillon, Ohio.
Wyckoff Drawn Steel Co., Pittsburgh, Pa.
STEEL—Cold Rolled Strips
Acme Steel Co., Chicago.
American Steel & Wire Co. (U. S. Steel Corp. Subsidiary), Chicago.
Athena Steel Co., Clifton, N. J.
Bethlehem (Pa.) Steel Co.
Cold Metal Process Co., The, Youngstown, Ohio.
Griffin Mfg. Co., Erie, Pa.
Latrobe (Pa.) Electric Steel Co.
Republic Steel Corp., Cleveland, Ohio.
Ryerson, Jos. T., & Son, Inc., Chicago.
Scully Steel Products Co. (U. S. Steel Corp. Subsidiary), Chicago.
Stanley Works, The, New Britain, Conn.; Bridgeport, Conn.
Steel & Tubes, Inc., Cleveland.
Superior Steel Corp., Grant Bldg., Pgh.
Thomas Steel Co., The, Warren, Ohio.
Weirton (W. Va.) Steel Co.
Wetherill Bros. Co., Cambridge, 39, Mass.
STEEL—Cold Rolled Strips, Electro Coated
Thomas Steel Co., The, Warren, Ohio.
STEEL—Cold Rolled Strips, Electro-Galvanized
Acme Steel Co., Chicago, Ill.
Thomas Steel Co., The, Warren, Ohio.
STEEL—Cold Rolled Strips, Electro Tin Coated
Thomas Steel Co., The, Warren, Ohio.
STEEL—Cold Rolled Strips, Stainless
Acme Steel Co., Chicago.
Griffin Mfg. Co., Erie, Pa.
STEEL—Corrosion Resisting
Carpenter Steel Co., The, 121 W. Bern St., Reading, Pa.
Midvale Co., The, Nicetown, Phila., Pa.
STEEL—Crucible
Jessop Steel Co., Washington, Pa.
Vanadium-Alloys Steel Co., Latrobe, Pa.
STEEL—Cutlery
Carpenter Steel Co., The, 121 W. Bern St., Reading, Pa.
Jessop Steel Co., Washington, Pa.
Latrobe (Pa.) Electric Steel Co.
Ludlum Steel Co., Watervliet, N. Y.
STEEL—Die
Andrews Steel Co., The, Newport, Ky.
Carpenter Steel Co., The, 121 W. Bern St., Reading, Pa.
Diston, Henry, & Sons, Inc., Philadelphia.
Jessop, Wm., & Sons, Inc., 121 Varick St., N. Y. C.
Latrobe (Pa.) Electric Steel Co.
Ludlum Steel Co., Watervliet, N. Y.
Milne, A., & Co., 745 Washington St., N. Y. C.
STEEL—Drill
Latrobe (Pa.) Electric Steel Co.
Ludlum Steel Co., Watervliet, N. Y.
Milne, A., & Co., 745 Washington St., N. Y. C.
STEEL—Electric
Carpenter Steel Co., The, 121 W. Bern St., Reading, Pa.
Diston, Henry, & Sons, Inc., Philadelphia.
Latrobe (Pa.) Electric Steel Co.
Ludlum Steel Co., Watervliet, N. Y.
Timken Roller Bearing Co., The, Canton, O.
Timken Steel & Tube Div., The Timken Roller Bearing Co., Canton, O.
Wheelock, Lovejoy & Co., Inc., Cambridge, Mass.
STEEL—High Speed
Bethlehem (Pa.) Steel Company.
Carpenter Steel Co., The, 121 W. Bern St., Reading, Pa.
Ingersoll Steel & Disc Co., Chicago.
Jessop Steel Co., Washington, Pa.
Latrobe (Pa.) Electric Steel Co.
Ludlum Steel Co., Watervliet, N. Y.
Milne, A., & Co., 745 Washington St., N. Y. C.
Vanadium-Alloys Steel Co., Latrobe, Pa.
STEEL—Hot Rolled Strips
Acme Steel Co., Chicago.
Bethlehem (Pa.) Steel Co.
Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.
Great Lakes Steel Corp., Detroit.
Inland Steel Co., Chicago.
Laclede Steel Co., St. Louis, Mo.
Latrobe (Pa.) Electric Steel Co.
Republic Steel Corp., Cleveland, Ohio.
Scully Steel Products Co. (U. S. Steel Corp. Subsidiary), Chicago.
Stanley Works, The, New Britain, Conn.; Bridgeport, Conn.
Steel & Tubes, Inc., Cleveland.
Superior Steel Corp., Grant Bldg., Pgh.
Weirton (W. Va.) Steel Co.
STEEL—Hot Rolled Strips, Electro Zinc Coated
Thomas Steel Co., The, Warren, Ohio.
STEEL—Hot Rolled Strips, Galvanized
Acme Steel Co., Chicago.
STEEL—Magnet
Carpenter Steel Co., The, 121 W. Bern St., Reading, Pa.
Latrobe (Pa.) Electric Steel Co.
STEEL—Nickel
Andrews Steel Co., The, Newport, Ky.
STEEL—Open Hearth
Andrews Steel Co., The, Newport, Ky.
Pittsburgh (Pa.) Steel Co.
Timken Roller Bearing Co., The, Canton, O.
Timken Steel & Tube Div., The Timken Roller Bearing Co., Canton, O.
STEEL—Rolled Manganese
Manganese Steel Forge Co., Phila.
STEEL—Rustless
Acme Steel Co., Chicago.
Carpenter Steel Co., The, 121 W. Bern St., Reading, Pa.
Griffin Mfg. Co., Erie, Pa.
Latrobe (Pa.) Electric Steel Co.
Ludlum Steel Co., Watervliet, N. Y.
STEEL—Screw
Bliss & Laughlin, Inc., Harvey, Ill.
Timken Roller Bearing Co., The, Canton, O.
Timken Steel & Tube Div., The Timken Roller Bearing Co., Canton, O.
Union Drawn Steel Co., Massillon, Ohio.
Wyckoff Drawn Steel Co., Pittsburgh, Pa.
STEEL—Special Analysis
Andrews Steel Co., The, Newport, Ky.
Carpenter Steel Co., The, 121 W. Bern St., Reading, Pa.
Harrisburg (Pa.) Steel Corp.
Latrobe (Pa.) Electric Steel Co.
Ludlum Steel Co., Watervliet, N. Y.
Republic Steel Corp., Cleveland, Ohio.
Timken Roller Bearing Co., The, Canton, O.
Timken Steel & Tube Div., The Timken Roller Bearing Co., Canton, O.
STEEL—Spring
Athena Steel Co., Clifton, N. J.
Barnes-Gibson-Raymond, Detroit Plant, Div. of Associated Spring Corp.
Barnes, Wallace, Co., The, Div. of Associated Spring Corp., Bristol, Conn.

Products Index

Gibson, Wm. D., Co., Div. of Associated Spring Corp., Chicago.
Great Lakes Steel Corp., Detroit.
Republic Steel Corp., Cleveland, Ohio.
Timken Roller Bearing Co., The, Canton, O.
Timken Steel & Tube Div., The Timken Roller Bearing Co., Canton, O.

STEEL—Stainless
Acme Steel Co., Chicago.
American Rolling Mill Co., Middletown, O.
Bethlehem (Pa.) Steel Company.
Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.

Carpenter Steel Co., The, 121 W. Bern St., Reading, Pa.
Disston, Henry & Sons, Inc., Philadelphia.
Latrobe (Pa.) Electric Steel Co.
Ludlum Steel Co., Watervliet, N. Y.
Midvale Co., The, Nicetown, Phila., Pa.
Republic Steel Corp., Cleveland, Ohio.
Ryerson, Jos. T., & Sons, Inc., Chicago.
Scully Steel Products Co. (U. S. Steel Corp. Subsidiary), Chicago.
Superior Steel Corp., Grant Bldg., Pittsburgh.

Union Drawn Steel Co., Massillon, Ohio.
Wetherell Bros. Co., Cambridge, 39, Mass.

STEEL—Stainless
Ingersoll Steel & Disc Co., Chicago.

STEEL—Tool
Bethlehem (Pa.) Steel Company.
Bissett Steel Co., The, Cleveland.
Carpenter Steel Co., The, 121 W. Bern St., Reading, Pa.

Darwin & Milner, Inc., Cleveland.
Disston, Henry & Sons, Inc., Philadelphia.
Ingersoll Steel & Disc Co., Chicago.
Jesseop Steel Co., Washington, Pa.
Jesseop, Wm., & Sons, Inc., 121 Varick St., N. Y. C.

Latrobe (Pa.) Electric Steel Co.
Ludlum Steel Co., Watervliet, N. Y.
Midvale Co., The, Nicetown, Phila., Pa.
Milne, A., & Co., 745 Washington St., N. Y. C.

Ryerson, Jos. T., & Sons, Inc., Chicago.
Tennessee Coal, Iron & Railroad Co. (U. S. Steel Corp. Subsidiary), Birmingham, Ala.
Vanadium-Alloys Steel Co., Latrobe, Pa.

Whitlock, Lovejoy & Co., Inc., Cambridge, Mass.

Windau Steel Co., Cleveland.

STEEL—Tool, Special Shapes
Forging & Casting Corp., The, Ferndale, Mich.

Latrobe (Pa.) Electric Steel Co.

STEEL—Vanadium
Andrews Steel Co., The, Newport, Ky.

Latrobe (Pa.) Electric Steel Co.

STEEL PLANTS AND ROLLING MILLS
Brassett, H. A., & Co., Chicago, Ill.

STEEL ROLLS
United Engineering & Fdry. Co., Pgh.

STOKERS
Babcock & Wilcox, The, 85 Liberty St., New York City.

Whiting Corp., Harvey, Ill.

STOP WATCHES
Stillman, M. J., Co., Inc., Chicago.

STOPS—Crane Limit
Electric Controller & Mfg. Co., The, Cleveland.

STRAIGHTENING MACHINES—Bar & Tube
Aetna-Standard Engineering Co., The, Youngstown, Ohio.

Kane & Roach, Inc., Syracuse, New York.
Medart Co., The, St. Louis, Mo.

STRAIGHTENING MACHINES—Wire
Kane & Roach, Inc., Syracuse, New York.

STRUCTURAL IRON AND STEEL WORK
American Bridge Co. (U. S. Steel Corp. Subsidiary), Pittsburgh.

Bethlehem (Pa.) Steel Co.
Morgan Engineering Co., The, Alliance, O.

STRUCTURAL STEEL—See Angles, Beams, Channels and Tees

STUDS
Erie (Pa.) Bolt & Nut Co.

SUPERHEATERS
Babcock & Wilcox Co., The, 85 Liberty St., New York City.

SWAGING MACHINES
Etna Machine Co., The, Toledo, Ohio.

Standard Machinery Co., Providence, R. I.
Torrington (Conn.) Company.

SWITCHES—Electric
Westinghouse Elec. & Mfg. Co., East Pgh.

TANK LININGS
Cellulose Co., The, Cleveland.

Nukem Prods. Corp., 68 Niagara St., Buffalo, N. Y.

TANK LININGS—Rubber
Goodrich, B. F., Co., The, Akron, Ohio.

Goodyear Tire & Rubber Co., Akron, Ohio.
Manhattan Rubber Mfg. Div. of Raybestos-Manhattan, Inc., The, 2 Townsend St., Passaic, N. J.

TANKS—Alkali Cleaning
Detroit Eex Products Co., Detroit, Mich.

TANKS—Compressed Air, Gas, Oil and Water
Petroleum Iron Works Co., The, Sharon, Pa.

Scalfe, Wm. B., & Sons Co., Pgh.
Westinghouse Air Brake Co., Industrial Div., Pittsburgh.

TANKS—Iron and Steel
Munroe R., & Son Mfg. Corp., Pittsburgh.

Petroleum Iron Works Co., The, Sharon, Pa.
Scalfe, Wm. B., & Sons, Co., Pgh.

TANKS—Lead Lined
Dietzel Lead Burning Co., Pittsburgh.

TANKS—Pickling
Atlas Mineral Prods. Co. of Pa., The, Meristown, Pa.

Blaw-Knox Co., Pittsburgh.
Cleveland (Ohio) Quarries Co., The.

Goodrich, B. F., Co., The, Akron, Ohio.
Goodyear Tire & Rubber Co., Akron, Ohio.

Manhattan Rubber Mfg. Div. of Raybestos-Manhattan, Inc., The, 2 Townsend St., Passaic, N. J.

Nukem Products Corp., 68 Niagara St., Buffalo, N. Y.

TANKS—Rubber Lined
Blaw-Knox Co., Pittsburgh.

Goodrich, B. F., Co., The, Akron, Ohio.
Goodyear Tire & Rubber Co., Akron, Ohio.

Manhattan Rubber Mfg. Div. of Raybestos-Manhattan, Inc., The, 2 Townsend St., Passaic, N. J.

TANKS—Welded
Blaw-Knox Co., Pittsburgh.

National Tube Co. (U. S. Steel Corp. Subsidiary), Pittsburgh.

Petroleum Iron Works Co., The, Sharon, Pa.

Scalfe, Wm. B., & Sons Co., Pittsburgh.

TAPPING MACHINES
Baker Bros. Inc., Toledo, Ohio.

Ex-Cell-O Corp., 1209 Oakman Blvd., Detroit.

National Automatic Tool Co., Richmond, Ind.

TAPS—Collapsing
Landis Mach. Co., Inc., Waynesboro, Pa.

Murphy Machine & Tool Co., Detroit.
National Acme Co., The, Cleveland.

TAPS AND DIES
Greenfield (Mass.) Tap & Die Corp.

Landis Mach. Co., Inc., Waynesboro, Pa.
Morse Twist Drill & Mch. Co., New Bedford, Mass.

Pratt & Whitney Div. Niles-Bement-Pond Co., Hartford, Conn.

TEES—See Angles, Beams, Channels and Tees

TELEPHONES—Interior
Screw Machine Products Corp., Prov., R. I.

TERNE PLATES
Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.

Weirton (W. Va.) Steel Co.

TESTING MACHINES—Materials
Baldwin-Southwark Corp., Southwark Div., Phila.

THERMOMETERS—Recording
Leeds & Northrup Co., Philadelphia.

THERMOSTATIC—Bimetal
Chace, W. M., Co., 1605 Beard Ave., Detroit.

THREAD CUTTING TOOLS—See Die Taps

THREAD ROLLING MACHINES
Manville, E. J., Mch. Co., Waterbury, Ct.

Nilson, A. H., Mach. Co., Bridgeport, Ct.
Waterbury (Ct.) Farrel Fdry. & Mch. Co., The.

THREADING MACHINES
Eastern Mch. Screw Corp., New Haven, Conn.

Landis Mch. Co., Inc., Waynesboro, Pa.

THREADING MACHINES—Automatic
Landis Mch. Co., Inc., Waynesboro, Pa.

THREADING MACHINES—Belt
Murphy Machine & Tool Co., Detroit.

TIE PLATES
Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.

Weirton (W. Va.) Steel Co.

TIES—BALE
Acme Steel Co., Chicago, Ill.

TIMING INSTRUMENTS
Stillman, M. J., Co., Inc., Chicago.

TIN PLATE
Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.

Granite City (Ill.) Steel Co.
Inland Steel Co., Chicago.

Jones & Laughlin Steel Corp., Pittsburgh.

Republic Steel Corp., Cleveland, Ohio.

Ryerson, Jos. T., & Sons, Inc., Chicago.

Weirton (W. Va.) Steel Co.

TIN PLATE MACHINERY
Aetna-Standard Engineering Co., The, Youngstown, Ohio.

Wean Engineering Co., Inc., The, Warren, Ohio.

TINNING EQUIPMENT—Sheets
Wean Engineering Co., Inc., The, Warren, Ohio.

TONGS—Automatic
Heppenstall Co., Pittsburgh.

TOOL BITS
Carboloy Co., Inc., 2985 E. Jefferson Ave., Detroit.

TOOL HOLDERS
Armstrong Bros. Tool Co., Chicago.

Williams, J. H., & Co., Buffalo, N. Y.

TOOLS—Lathe
Armstrong Bros. Tool Co., Chicago.

Carboloy Co., Inc., 2985 E. Jefferson Ave., Detroit.

TOOLS—Metal Cutting
Carboloy Co., Inc., 2985 E. Jefferson Ave., Detroit.

Michigan Tool Co., Detroit.

Pratt & Whitney Div. Niles-Bement-Pond Co., Hartford, Conn.

TOOLS—Precision
Starrett, L. S., Co., Athol, Mass.

TOOLS—Safety, Steel Stamp
Cunningham, M. E., Co., Pittsburgh.

The trail of good spring
PERFORMANCE

leads
to



RAYMOND SPRINGS

DIVISION OF ASSOCIATED SPRING CORPORATION
RAYMOND MFG. CO., CORRY, PA.

SPRINGS

For all mechanical purposes up to and including 9/16 gage round or square wire.

Also wire forms and springs of flat spring steel. We specialize in lighter wire gages.

U. S. STEEL WIRE SPRING COMPANY

East 53rd St. & Hamilton Ave., Cleveland, Ohio

Build to excel with

LEE-BUILT SPRINGS

COMPRESSION — EXTENSION — FLAT — TORSION
WIRE FORMS — SMALL STAMPINGS

LEE SPRING COMPANY, Inc.

30 MAIN STREET — BROOKLYN, N. Y.

CHEMICALS
ACP
PROCESSES


CHEAPER AND BETTER
PICKLING WITH
RODINE

AMERICAN CHEMICAL PAINT CO.
Ambler, Pa.

BROOKE
PIG IRON

E. & G. BROOKE IRON CO.
BIRDSBORO, PENNA.

MORE OF
HIGH GRADE
FOUNDRY
BASE
GREY FOUNDRY
MALLEABLE
BESSEMER
LOW PHOS.



CERTIFICATE OF INSPECTION
JOHANSSON GAGE BLOCKS
 Ford Motor Company
 JOHANSSON DIVISION
 Dearborn, Mich.

**LOW-COST
 INSPECTION SERVICE FOR
 JOHANSSON GAGE BLOCKS**

• All users of Johansson Gage Blocks are entitled to this low-cost inspection service which includes: (1) Measurement and inspection of blocks. (2) Removal of high spots caused by use or accident. (3) Issuing of Certificate of Inspection which shows nominal and actual size of each block

and amount of variation in millionths of an inch.
 • The charge is only 20 cents for "A" and "B" quality blocks up to one inch in length; for longer blocks, 20 cents per inch of length. Minimum charge \$1. A periodic check will eliminate possible errors in measuring.

FORD MOTOR COMPANY
 Johansson Division, Dept. E Dearborn, Michigan



Productimeters
 STROKE, REVOLUTION AND ELECTRIC COUNTERS for all production machines — Punch presses, Drill presses, Screw machines, conveyors, engines, pumps, stokers, etc.
 LINEAL COUNTERS for Paper, Textiles, Wire, Lumber, etc.

Write for Productimeter Catalog

DURANT MFG. CO., 1919 N. Buffum St., Milwaukee, Wis.

MITCO
 OPEN STEEL FLOORING

Pressure Formed • 90% Open Area • Easy to Install

HENDRICK MANUFACTURING COMPANY
 37 Dundaff Street, Carbondale, Pa.

WIRE

THE SENECA WIRE & MFG. CO.

IRON
 All Sizes
 Finishes
STEEL



FOSTORIA, O.

**RIVETED KEYS — FLAT SPRING KEYS
 — COTTER PINS —**

WESTERN WIRE PRODUCTS CO.
 ST. LOUIS, U.S.A.

Products Index

TOOLS—Tungsten Carbide
 Carboly Co., Inc., 2985 E. Jefferson Ave., Detroit.
 Ex-Cell-O Corp., 1200 Oakman Blvd., Detroit.

TORCHES—Brazing, Cutting and Welding
 Air Reduction Sales Co., 60 East 42nd St., N. Y. C.
 Linde Air Prods. Co., The, 30 East 42nd St., N. Y. C.
 Milburn, Alexander Co., The, Baltimore, Md.
 Weldit Acetylene Co., Detroit.

TORCHES—Gas
 Torit Mfg. Co., St. Paul, Minn.

TRACTORS AND TRAILERS—See Trucks, Tractors and Trailers—Industrial

TRAILERS—Industrial—See Trucks, Tractors and Trailers—Industrial

TRAMRAILS—Overhead Systems
 Cleveland Tramrail Div. of The Cleveland Crane & Engng. Co., Wickliffe, Ohio.
 Harnischfeger Corp., 4401 W. National Ave., Milwaukee.

TRAMWAYS—Wire Rope
 Leschen, A. & Sons Rope Co., St. Louis, Mo.

TRANSCRIBING MACHINES
 Dictaphone Sales Corp., 420 Lexington Ave., New York City.

TRANSMISSIONS—Hydraulic
 American Engineering Co., Philadelphia.
 Oilgear Co., The, 1311 W. Bruce St., Milwaukee.

TRANSMISSIONS—Variable Speed
 Link-Belt Co., Chicago.
 Reeves Pulley Co., Columbus, Indiana.

TRAPS—Steam
 Nicholson, W. H. & Co., 165 Oregon St., Wilkes-Barre, Pa.

TREADS—Safety
 American Pressed Steel Co., Phila., Pa.
 Blaw-Knox Co., Pittsburgh.
 Central Iron & Steel Co., Harrisburg, Pa.
 Hendrick Mfg. Co., Carbondale, Pa.
 Norton Co., Worcester, Mass.

TROLLEYS
 Curtis Pneumatic Machinery Co., 1948 Kienlen Ave., St. Louis, Mo.

TRUCKS—Dump (Industrial)
 Townmotor, Inc., Cleveland.

TRUCKS—Elevating (Power)
 Baker-Raulang Co., The, 2175 W. 25th St., Cleveland.
 Elwell-Parker Electric Co., The, Cleveland.
 Townmotor, Inc., Cleveland.

TRUCKS—Factory, Hand
 Lewis-Shepard Co., 122 Walnut St., Watertown Station, Boston.

TRUCKS—Lift (Hand & Foot)
 Lewis-Shepard Co., 122 Walnut St., Watertown Station, Boston.

TRUCKS—Scoop (Industrial)
 Townmotor, Inc., Cleveland.

TRUCKS, TRACTORS AND TRAILERS—Industrial
 Atlas Car & Mfg. Co., The, Cleveland.
 Baker-Raulang Co., The, 2175 W. 25th St., Cleveland.
 Elwell-Parker Electric Co., The, Cleveland.
 Townmotor, Inc., Cleveland.

TUBE MILL MACHINERY
 Aetna-Standard Engineering Co., The, Youngstown, Ohio.
 Taylor-Wilson Mfg. Co., McKees Rocks, Pa.
 United Engineering & Fdry. Co., Pgh. Waterbury (Conn.) Farrel Foundry & Machine Co., The.

TUBES—Boiler
 National Tube Co. (U. S. Steel Corp. Subsidiary), Pittsburgh.
 Pittsburgh (Pa.) Steel Co.
 Steel & Tubes, Inc., Cleveland.

TUBES—Copper Alloy
 American Brass Co., The, Waterbury, Conn.

TUBES—High Carbon
 Steel & Tubes, Inc., Cleveland.

TUBES—Nickel Silver
 American Brass Co., The, Waterbury, Conn.
 Revere Copper & Brass, Inc., 230 Park Ave., N. Y. C.

TUBES—Stainless Steel
 Cleveland (Ohio) Tool & Supply Co., The.
 National Tube Co. (U. S. Steel Corp. Subsidiary), Pittsburgh.

TUBING—Aluminum Seamless
 Aluminum Co. of America, Pittsburgh.

TUBING—Aluminum Alloy
 Dow Chemical Co., The, 921 Jefferson Ave., Midland, Mich.

TUBING—Nichrome
 Steel & Tubes, Inc., Cleveland.

TUBING—Open Seam
 Steel & Tubes, Inc., Cleveland.

TUBING—Phosphor Bronze
 American Brass Co., The, Waterbury, Conn.
 Phosphor Bronze Smelting Co., The, Phila.
 Revere Copper & Brass, Inc., 230 Park Ave., N. Y. C.

TUBING—Rubber
 Goodrich, B. F. Co., The, Akron, Ohio.

TUBING—Seamless Steel
 National Tube Co. (U. S. Steel Corp. Subsidiary), Pittsburgh.
 Pittsburgh (Pa.) Steel Co.
 Ryerson, Jos. T. & Son, Inc., Chicago.
 Steel & Tubes, Inc., Cleveland.
 Timken Roller Bearing Co., The, Canton, O.
 Timken Steel & Tube Div., The Timken Roller Bearing Co., Canton, O.
 Youngstown (Ohio) Sheet & Tube Co., The.

TUBING—Square and Rectangular
 Steel & Tubes, Inc., Cleveland.

TUBING—Stainless Steel
 Cleveland (Ohio) Tool & Supply Co., The.
 Steel & Tubes, Inc., Cleveland.

TUBING—Tinned Brass or Copper
 Bundy Tubing Co., Detroit, Mich.

TUBING—Tinned-Steel
 Bundy Tubing Co., Detroit, Mich.

TUBING—Tool Steel
 Bissett Steel Co., The, Cleveland.

TUBING—Welded Steel
 Bundy Tubing Co., Detroit, Mich.
 National Tube Co. (U. S. Steel Corp. Subsidiary), Pittsburgh.
 Steel & Tubes, Inc., Cleveland.
 Youngstown (Ohio) Sheet & Tube Co., The.

TUBULAR PRODUCTS
 National Tube Co. (U. S. Steel Corp. Subsidiary), Pittsburgh.
 Steel & Tubes, Inc., Cleveland.

TUMBLING BARRELS—See Barrels—Tumbling

TUNGSTEN—Metals & Alloys
 Electro Metallurgical Sales Corp., 30 E. 42nd St., N. Y. C.

TUNGSTEN CARBIDE
 Carboly Co., Inc., 2985 E. Jefferson Ave., Detroit.

TURBINE-GENERATORS—Steam
 General Electric Co., Schenectady, N. Y.
 Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

TURBO-COMPRESSORS
 Spencer Turbine Co., Hartford, Conn.

TURNABLES
 American Bridge Co. (U. S. Steel Corp. Subsidiary), Pittsburgh.

TURNABLES—Industrial
 Canton Fdry. & Mch. Co., Cleveland.

TWIST DRILLS
 Cleveland (Ohio) Twist Drill Co., The.
 Greenfield (Mass.) Tap & Die Corp.
 Morse Twist Drill & Mch. Co., New Bedford, Mass.

TYPE—Steel
 Noble & Westbrook Mfg. Co., The, East Hartford, Ct.

UNIONS
 Crane Co., Chicago.

UNIT HEATERS—Electric
 American Foundry Equipment Co., The, 401 Byrkit St., Mishawaka, Ind.

VALVES—Acid Resisting
 Dietzel Lead Burning Co., Pittsburgh.
 Duriron Co., Inc., The, 438 N. Findlay St., Dayton, Ohio.

VALVES—Air Blast for Presses
 Littell, F. J., Mch. Co., Chicago.

VALVES—Air & Hydraulic Control
 Galland-Henning Mfg. Co., Milwaukee.
 Hannifin Mfg. Co., Chicago.

VALVES—Gas, Water and Steam
 Crane Co., Chicago.
 Jarecki Mfg. Co., Erie, Pa.
 North American Mfg. Co., The, Cleveland.
 Wood, R. D., & Co., Philadelphia.

VALVES—Hydraulic
 Baldwin-Southwark Corp., Southwark Div., Philadelphia.
 Crane Co., Chicago.
 Galland-Henning Mfg. Co., Milwaukee.
 Wood, R. D., & Co., Philadelphia.

VALVES—(Pressure Seated) Pneumatic
 Cleveland (Ohio) Pneumatic Tool Co., The.

VALVES—Proportioning
 North American Mfg. Co., The, Cleveland.

VALVES—Pump, Rubber
 Garlock Packing Co., The, Palmyra, N. Y.

VANADIUM
 Electro Metallurgical Sales Corp., 30 E. 42nd St., N. Y. C.

VARNISH—Acid Resisting
 Nukem Products Corp., 68 Niagara St., Buffalo, N. Y.

VICES
 Cincinnati (Ohio) Milling Mch. Co., The.
 Jarecki Mfg. Co., Erie, Pa.

WASHERS—Iron or Steel
 Central Iron & Steel Co., Harrisburg, Pa.
 Sessions, J. H., & Son, Bristol, Conn.

WASHERS—Leather
 Chicago (Ill.) Rawhide Mfg. Co., The, 1306 Elston Ave.

WASHERS—Lock
 American Nut & Bolt Fastener Co., Pittsburgh.

Beall Tool Co., East Alton, Ill.
Butcher & Hart Mfg. Co., Toledo, Ohio.
Eaton Mfg. Co., Massillon, Ohio.
Heitz & Heitz, Inc., 33-34th St., Brooklyn, N. Y.
Hobbs Mfg. Co., Worcester, Mass.
Houde Engineering Corp., Buffalo, N. Y.
National Lock Washer Co., The, Newark, N. J. and Milwaukee, Wis.
Philadelphia Steel & Wire Corp., Germantown, Philadelphia, Pa.
Positive Lock Washer Co., The, Newark, N. J.

Products Index

Spring Washer Industry, 616 Wrigley Bldg., Chicago, Ill.
Washburn Co., The, Worcester, Mass.

WASHERS—Spring
American Nut & Bolt Fastener Co., Pittsburgh.

Beall Tool Co., East Alton, Ill.
Butcher & Hart Mfg. Co., Toledo, Ohio.
Eaton Mfg. Co., Massillon, Ohio.
Hobbs Mfg. Co., Worcester, Mass.
National Lock Washer Co., The, Newark, N. J., and Milwaukee, Wis.
Philadelphia Steel & Wire Corp., Germantown, Philadelphia, Pa.
Positive Lock Washer Co., The, Newark, N. J.

Spring Washer Industry, 616 Wrigley Bldg., Chicago, Ill.

Washburn Co., The, Worcester, Mass.

WASHING MACHINES—For Metal Parts
Ranshoff, N., Inc., Cincinnati.

WATER SOFTENERS AND PURIFIERS
Scaife, Wm. B., & Sons Co., Pgh.

WELDING—Copper Hydrogen Electric
Bundy Tubing Co., Detroit, Mich.

WELDING—Electric
Lincoln Electric Co., The, Cleveland.

Una Welding, Inc., Cleveland, Ohio.

Westinghouse Elec. & Mfg. Co., East Pgh.

WELDING CONTACTORS
Clark Controller Co., The, Cleveland.

WELDING CONTACTS—Resistance
Electroly Co., Inc., 50 Church St., New York City.

WELDING AND CUTTING MACHINES
AND EQUIPMENT—Oxy-Acetylene

Air Reduction Sales Co., 60 East 42nd St., N. Y. C.

Linde Air Prods. Co., The, 30 East 42nd St., N. Y. C.

Milburn, Alexander Co., The, Baltimore, Md.

Weldit Acetylene Co., Detroit.

WELDING FIXTURES
Harnischfeger Corp., 4401 W. National Ave., Milwaukee, Wis.

Una Welding, Inc., Cleveland, Ohio.

WELDING MACHINES—Butt
Swift Electric Welder Co., Detroit.

Thomson-Gibb Elec. Welding Co., Lynn, Mass.

WELDING MACHINES—Electric Arc
Electric Arc Cutting & Welding Co., The, Newark, N. J.

General Electric Co., Schenectady, N. Y.

Harnischfeger Corp., 4401 W. National Ave., Milwaukee, Wis.

Hobart Bros., Troy, Ohio.

Lincoln Electric Co., The, Cleveland.

Una Welding, Inc., Cleveland, Ohio.

Westinghouse Elec. & Mfg. Co., East Pgh.

Wilson Welder & Metals Co., Inc., 60 E. 42nd St., New York City.

WELDING MACHINES—Electric Arc
Second-Hand. (See Clearing House Section)

WELDING MACHINES—Flash
Swift Electric Welder Co., Detroit.

Thomson-Gibb Elec. Welding Co., Lynn, Mass.

WELDING MACHINES—Press
Swift Electric Welder Co., Detroit.

WELDING MACHINES—Spot
Swift Electric Welder Co., Detroit.

Thomson-Gibb Elec. Welding Co., Lynn, Mass.

WELDING MACHINES—Universal Spot
& Arc

Electric Arc Cutting & Welding Co., The, Newark, N. J.

WHEELS—Rolled Steel
Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.

Standard Steel Wks. Co., Burnham, Pa.

WIRE—Aluminum
Aluminum Co. of America, Pittsburgh.

WIRE—Barb
Jones & Laughlin Steel Corp., Pittsburgh.

Pittsburgh (Pa.) Steel Co.

WIRE—Brass, Bronze, Copper, Nickel
Silver or Phosphor Bronze

American Brass Co., The, Waterbury, Conn.

Michigan Wire Cloth Co., 2117 Howard St., Detroit.

Phosphor Bronze Smelting Co., The, Phila.

Revere Copper & Brass, Inc., 230 Park Ave., N. Y. C.

Riverside (N. J.) Metal Co.

Seymour (Conn.) Mfg. Co.

WIRE—Electric Heat Resisting
Global Div., The Carborundum Co., Niagara Falls, N. Y.

WIRE—Flat, Round Square or Special
Shapes

American Steel & Wire Co. (U. S. Steel Corp. Subsidiary), Chicago.

Barnes, Wallace Co., The, Div. of Associated Spring Corp., Bristol, Conn.

Page Steel & Wire Div., American Chain & Cable Co., Inc., Monessen, Pa.

Roebbing's, John A., Sons Co., Trenton, N. J.

Seneca Wire & Mfg. Co., The, Fostoria, O.

WIRE—Netting
Roebbing's, John A., Sons Co., Trenton, N. J.

Wickwire Brothers, Cortland, N. Y.

WIRE—Plane and Music
Webb Wire Works, New Brunswick, N. J.

Wickwire Spencer Steel Co., 41 East 42nd St., N. Y. C.

WIRE—Special Drawn Shapes
Bathbone, A. B. & J., Palmer, Mass.

WIRE—Spring
American Steel & Wire Co. (U. S. Steel Corp. Subsidiary), Chicago.

Barnes, Wallace Co., The, Div. of Associated Spring Corp., Bristol, Conn.

Columbia Steel Co. (U. S. Steel Corp. Subsidiary), San Francisco, Calif.

Jones & Laughlin Steel Corp., Pittsburgh.

Pittsburgh (Pa.) Steel Co.

Roebbing's, John A., Sons Co., Trenton, N. J.

Seneca Wire & Mfg. Co., The, Fostoria, Ohio.

WIRE—Spring (Music)
Webb Wire Works, New Brunswick, N. J.

WIRE—Stainless Steel
Page Steel & Wire Div., American Chain & Cable Co., Inc., Monessen, Pa.

Webb Wire Works, New Brunswick, N. J.

WIRE—Steel
Bethlehem (Pa.) Steel Co.

Wickwire Brothers, Cortland, N. Y.

WIRE—Water-proof Rubber Insulated
Simplex Wire & Cable Co., Cambridge A. Boston, Mass.

WIRE—Welding
Air Reduction Sales Co., 60 East 42nd St., N. Y. C.

American Steel & Wire Co. (U. S. Steel Corp. Subsidiary), Chicago.

Lincoln Electric Co., The, Cleveland.

Manganese Steel Forge Co., Phila., Pa.

Maurath, Inc., 7400 Union Ave., Cleveland.

Page Steel & Wire Div., American Chain & Cable Co., Inc., Monessen, Pa.

Pittsburgh (Pa.) Steel Co.

Revere Copper & Brass, Inc., 230 Park Ave., N. Y. C.

Roebbing's, John A., Sons Co., Trenton, N. J.

Seneca Wire & Mfg. Co., The, Fostoria, Ohio.

Una Welding, Inc., Cleveland, Ohio.

Wickwire Brothers, Cortland, N. Y.

Wickwire Spencer Steel Co., 41 East 42nd St., N. Y. C.

Wilson Welder & Metals Co., Inc., 60 E. 42nd St., New York City.

WIRE—Zinc
Platt Bros. & Co., The, Waterbury, Conn.

WIRE CLOTH
Audubon Wire Cloth Corp., Phila., Pa.

Buffalo (N. Y.) Wire Wks. Co., Inc.

Michigan Wire Cloth Co., 2117 Howard St., Detroit, Mich.

Roebbing's, John A., Sons Co., Trenton, N. J.

Wickwire Bros., Cortland, N. Y.

Wickwire Spencer Steel Co., 41 East 42nd St., N. Y. C.

WIRE DRAWING MACHINERY—See
Wire Mill Machinery & Equip.

WIRE FORMING MACHINERY
Baird Mch. Co., The, Bridgeport, Conn.

Manville, E. J., Mch. Co., Waterbury, Ct.

Nilson, A. J., Mch. Co., Bridgeport, Ct.

Sleeper & Hartley, Inc., Worcester, Mass.

WIRE MILL MACHINERY AND
EQUIPMENT

Morgan Construction Co., Worcester, Mass.

Sleeper & Hartley, Inc., Worcester, Mass.

Waterbury (Ct.) Farrel Fdry. & Mch. Co., The.

WIRE NAIL MACHINERY
Sleeper & Hartley, Inc., Worcester, Mass.

WIRE PRODUCTS
American Spring & Mfg. Corp., Holly, Mich.

American Steel & Wire Co. (U. S. Steel Corp. Subsidiary), Chicago.

Buffalo (N. Y.) Wire Wks. Co., Inc.

Eastern Tool & Mfg. Co., Bloomfield, N. J.

Hindley Mfg. Co., Valley Falls, R. I.

Pittsburgh (Pa.) Steel Co.

U. S. Steel Wire Spring Co., Cleveland, O.

Wickwire Bros., Cortland, N. Y.

Wickwire Spencer Steel Co., 41 East 42nd St., N. Y. C.

WIRE ROPE
American Steel & Wire Co. (U. S. Steel Corp. Subsidiary), Chicago.

Columbia Steel Co. (U. S. Steel Corp. Subsidiary), San Francisco, Calif.

Leschen, A., & Sons Rope Co., St. Louis, Mo.

Roebbing's, John A., Sons Co., Trenton, N. J.

Wickwire Spencer Steel Co., 41 East 42nd St., N. Y. C.

WIRE ROPE FITTINGS
Roebbing's, John A., Sons Co., Trenton, N. J.

WIRE STRAIGHTENING AND CUTTING MACHINERY—Automatic
Shuster, F. B. Co., The, New Haven, Ct.

WRENCHES
Armstrong Bros. Tool Co., Chicago.

Williams, J. H., & Co., Buffalo, N. Y.

WRENCHES—Pipe
Greenfield (Mass.) Tap & Die Corp.

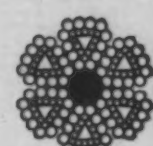
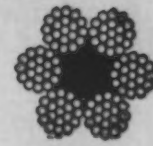
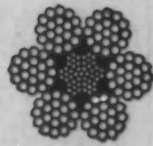
WRENCHES—Pneumatic
Ingersoll-Rand Co., 11 Broadway, N. Y. C.

ZINC—SLAB (Spelter)
New Jersey Zinc Co., The, 160 Front St., N. Y. C.

ZINC—Strip
Platt Bros. & Co., The, Waterbury, Conn.

ZIRCONIUM METAL & ALLOYS
Electro Metallurgical Sales Corp., 30 E. 42nd St., N. Y. C.

Leschen Wire Rope for Every Requirement



In successful Wire Rope usage construction is a factor quite as important as the proper selection of material.

The accompanying illustrations show cross section views of some of the various constructions we furnish. Every construction is made according to the "Leschen" standard.

If you are experiencing any Wire Rope trouble, probably either the construction or the quality is not suited to your particular work, our Engineering Department will gladly advise with you, without putting you under any obligation.

Established 1857

A. Leschen & Sons Rope Co.

Makers of

HERCULES (Red-Strand) WIRE ROPE

ST. LOUIS, U. S. A.

New York

Chicago

Denver

San Francisco

STAINLESS WIRE

SHIP

BRAND



THE
WEBB WIRE WORKS

NEW BRUNSWICK, N. J.

BOX 173



Buffalo WIRE

PLAIN STEEL OR GALVANIZED WIRE CLOTH AND WIRE PRODUCTS. ALL METALS—FOR ALL INDUSTRIAL PURPOSES SINCE 1898. CATALOG NO. 10-K.

BUFFALO WIRE WORKS CO., Inc.
(Formerly Schoeller's Sons—Est. 1868)
456 Terrace Buffalo, N. Y.

zinc

WIRE STRIP, COILED FOR FUSE ELEMENTS EYELETS ALSO BRASS or STEEL

THE PLATT BROS. & CO., WATERBURY, CONN.

SEND FOR "GREEN LIST"

JUST ISSUED

Automatics—No. 2-G Brown & Sharpe
2 1/4" 3/4" 4 1/4" Gridley Sigs. Spdl.
Boring Machines 5" bar, N-B-P Floor Borer
5" Bar Newton Portable
No. 3 Hamilton, 4 1/4" bar
No. 2 Coffman, 3 1/4" bar
No. 36—Rechester Floor 3 1/2" bar
No. 3A Universal, 3" bar
No. 1 Cleveland, 2 1/2" bar
Boring Mills, 24", 42" Bullard "New Era"
30", 52" King
42" and 48" Colburn
54", 60" Colburn
Drills—1, 2, 3, 4, 6 spdl. Leland-Gifford
1, 2, 3, 4, 6 spdl. Henry & Wright
32" Cinn.-Bickford Sild. Hd.
No. 2 Colburn, 1, 2, 3, & 4 spdl.
Nos. 121, 314, 513 Baker
No. 210—1 and 3 spdl. Barnes
No. D-5 Colburn
No. 2 Western Multiple
No. 14 Natco Multiple
No. 4 Baush Multiple
Radials—4" Cinn.-Bickford Plain
4" American Triple Purpose
4" American Plain
5" American full univ., M.D.
6" Western Triple Grd.
6" American Triple Purpose
Gear Cutters, No. 18-H Gould & Eberhardt
No. 16 HS Gould & Eberhardt
No. 4—48" Brown & Sharpe
No. 6—60" Brown & Sharpe
No. 6—72" Brown & Sharpe
Nos. 6, 61, 62, 65, 615, 625 Fellows
6" Gleason bevel gear
Grinders, Heim Centerless
10"x36", 52" Landis, plain
20"x168" Landis, plain M.D.
No. 13 B. & S. Univ. Cutter & Tool
No. 4—12"x66" Landis Universal
No. 4—16"x66" Landis Universal
No. 2 Universal (Bath type)
No. 70 Head Internal
No. 1 1/2" Landis, Internal
No. 25 Head Rotary Surf.
No. 10 Blanchard, M.D.
No. 16-A Blanchard Surface
15"x17"x6", 8" Norton, O.S. surf., mag. chuck

MOTOR DRIVE NORTON GRINDERS

6"x32"	10"x96"
16"x18"	14"x36"
10"x24"	14"x50"
10"x36"	14"x72"
10"x50"	16"x50"
10"x72"	18"x96"
18"x144"	

Lathes, No. 3 Lodge & Shipley Duomatic
14"x 8" American, grd. hd., T.A.
14"x 8" Lodge & Shipley
16"x 8" Lodge & Shipley, Taper Attach.
16"x 8" American, Taper Attach.
18"x 8" Lodge & Shipley, sel. grd. hd., T.A.
18"x10" American, grd. hd., T.A.
20"x 8", 14" L. & S., sel. grd. hd.
24"x12" Lodge & Shipley, sel. grd. hd.
26"x12" LeBlond Crankshaft
30"x20" American grd. hd.
36"x18" Lodge & Shipley, patent head
36"x30" Rahn Larmen, grd. head
54"x23" Johnson, triple geared
66"x21" 31", 39" Putnam triple geared
Millers, No. 24 Hyv. Ohio, plain
No. 2, No. 3, No. 3-S Cincinnati, plain
No. 2-B, No. 3-B, No. 4-B, B. & S., plain
No. 3-B Milwaukee, plain
No. 4 Kompsmith Maxi-Miller, plain
No. 4 and No. 5 Cincinnati, plain
No. 1 1/2", No. 2, No. 2-A B. & S. Universal
No. 2-BB Milwaukee Universal
No. 3, No. 4 Cincinnati Universal
No. 1 1/2", No. 3-B Milwaukee Vert.
No. 2, No. 3 Cincinnati, H.P. Vert.
No. 4 Milwaukee Vert.
No. 5—48" Cincinnati Hydromatic
No. 4 and No. 8 Lees-Bradner Thread
Hanson Whitney Thread
24"x24"x12" Ingersoll Slab
36"x36"x12" Newton Duplex
38"x44"x20" Ingersoll Slab
48"x36"x16" Ingersoll Adj. Rail
Planers, 24"x24"x8" American
26" Lynd-Farquhar O.S., planer, shaper
30"x30"x 6" and 18" Cincinnati
30"x30"x14" Gray, Arr. Rev. M.D.
36"x36"x12" and 24" Gray
36"x36"x 8", 12", 18" Cincinnati
36"x36"x14"—24" Cleveland Open side
42"x42"x30" Niles-Bement-Pond, arr. rev., M.D.
48"x48"x14" Liberty Open Side
48"x48"x16" Niles-Bement-Pond
60"x48"x16" Gray, arr. rev., M.D.
60"x48"x20" Hamilton
72"x60"x16" American
Presses, No. 106 Bliss Double Crank
No. 173-A Consolidated Ohio, Crank
Shapers, 16" Gould & Eberhardt, M.D.
16" & 20" Stockbridge
20" & 24" Gould & Eberhardt
Turret Lathes No. 4 W. & S. Univ. Turret
No. 1-A Warner & Swasey, A.C. and B.F.
No. 2-B Foster
No. 3-A Warner & Swasey
No. 4-A Warner & Swasey 7 1/4" H.S.
No. 4-L Gisholt 9 1/4" H.S.

**HILL-CLARKE
MACHINERY CO.**
647 Washington Blvd. - Chicago

CAPITAL SAVINGS!

BORING MILLS—Horizontal
GIDDINGS & LEWIS No. 0, 3" bar
RYERSON No. 12, 4" bar
BEAMAN & SMITH 5" and 6" bar
NILES BEMENT POND No. 1 1/2" Port, 3 1/2" bar
BORING MILLS—Vertical
BULLARD 24"
BAUSH 53": 2 hds.
NILES BEMENT POND 7-10" Extension
NILES BEMENT POND 42"—44"—51"—53"
POND 90": 2 hds.

PLANERS
AMERICAN 36"x36"x20": 3 hds.
CINCINNATI 36"x36"x12": 2 hds.
NBP 48"x48"x16": 4 hds.
CLEVELAND 48"x48"x12" and 16" openside: 3 hds.

LATHES
PITTSBURGH 36"x28", grd. hd.
PUTNAM 50"x30", grd. hd.
PUTNAM 36"x28", 3 step cone, DBG.
BRIDGEFORD 36"x60" comb. boring and turning
BRIDGEFORD 36"x60", boring
AMERICAN 36"x21", grd. hd., OCG.
GREAVES KLUSMAN 18"x10" grd. motor-in-base
McCABE 24"x14", double spindle
LODGE & SHIPLEY 24"x10" cone dr.
SO. BEND 24"x10" cone dr.
GREAVES KLUSMAN 16"x8" motor-in-base
LODGE & SHIPLEY 36"x16" grd. hd.

MILLING MACHINES
BEAMAN & SMITH No. 1 Vert. and Horiz. spdl.
CINCINNATI 24", 48" Automatic
INGERSOLL No. 3 Combined heavy duty Vert.
INGERSOLL 24"x24"x12", planer type
INGERSOLL 24"x24"x12", slab
NEWTON No. 2 Ver. spdl., keyseat
BROWN & SHARPE No. 4 Universal cone dr.
CINCINNATI Nos. 2, 3, 4 Plain
LEES BRADNER No. 4 thread
HANSON & WHITNEY thread
PRATT & WHITNEY 4"x12, 6x48, 6x80 thread
BECKER C-1 and C-2 Vertical
KEARNEY & TRECKER No. 1 Plain, standardized
spdl.

7 PUTNAM 36" x 28" GEARED HEAD LATHES NEARLY NEW

A "buy" for someone!

DRILL PRESSES
NATCO No. 12, No. 13, No. 22 Multiple spdl.
NATCO CII Drill—mechanical feeds
NATCO CISH Drill—hydraulic feeds
PRATT & WHITNEY No. 12 rect. head
DRILLS—RADIAL
CINCINNATI BICKFORD 5" full univ.
CINCINNATI BICKFORD 8" Pls. SPD.
DRESES 3" and 5" Pl. SPD.
REED PRENTICE 4" Pl.
N.B.P. 8" Pl. SPD.

GEAR CUTTING EQUIPMENT
BROWN & SHARPE No. 6, 72" Gear Cutter
BARBER & COLMAN Nos. 3 and 12 Gear Hobbers
BROWN & SHARPE No. 34 Gear Hobber
CLEVELAND 8 spdl. Spline Hobber
GLEASON 15" Spiral Bevel Gear Finisher
GLEASON 10" Spiral Bevel Gear
FELLOWS No. 8B Burnisher
LEES BRADNER Lapper cap. 1 1/4"x8"

GRINDERS
BROWN & SHARPE No. 1 Univ.
BRYANT No. 3 Internal
BLANCHARD Nos. 10, 16 surface
HEALD Nos. 50, 55, 60, 65 Int.
HEALD No. 72 Hydr.: 72-A-3 Sizomatic
LANDIS 10x24, 10x36, 10x72
LANDIS 20x132 cylindrical
NORTON 14x72, 14x96 Plain Cyl.
NORTON type B81 14x30-36" crankpin
DIAMOND 84" Face
PRATT & WHITNEY No. 14 surface
SPRINGFIELD No. 7 Grinder

MISCELLANEOUS
CLEVELAND 3/4": 2-2 1/2": 2 1/4"-2 3/4" Model "A"
CLEVELAND Univ. relieving lathe
TREADWELL 12" pipe mach.
COCHRANE & BLY No. 14 Univ. Shaper & Miller
LIBBY 18" Model "A", 26"—7 1/2" hole
HILLES & JONES No. 4, 5 Bending Rolls
PRATT & WHITNEY No. 12 Profiler, grd.

ask for details
1000 other machines in stock

**MOREY
MACHINERY CO., INC.**
410 BROOME ST. NEW YORK

Just Purchased

No. 2 Cincinnati Centerless
8" Arter piston ring grinder

COMPRESSORS

21 cu. ft. 4 1/2"x4 1/2" Curtiss vertical
23 cu. ft. 4 1/2"x 5" Ingersoll Rand vertical
40 cu. ft. 8"x 6" Gardner Rix vertical
49 cu. ft. 8"x 6" Curtiss vertical
67 cu. ft. 6"x 6" Chicago Pneumatic hori-
zontal
87 cu. ft. 6"x 6" Bury horizontal
92 cu. ft. 7"x 6" Ingersoll Rand ERI
120 cu. ft. 8"x 6" Ingersoll Rand ERI
136 cu. ft. 8"x 6" Ingersoll Rand ERI
140 cu. ft. 8"x 8" Union class BL
184 cu. ft. 9"x 10" Gardner Rix
245 cu. ft. 10"x 10" Ingersoll Rand ERI
265 cu. ft. 9 1/2"x 10" Worthington
355 cu. ft. 12"x 10" Ingersoll Rand ERI
389 cu. ft. 12"x 10" Chicago Pneumatic NSB
446 cu. ft. 14"x 9"x10" Bury two stage
655 cu. ft. 16"x 10"x12" Union two stage
3,200 cu. ft. General Electric centrifugal

SHAPERS

7" Rhodes
16" Cincinnati
16" Ohio
16" Gould & Eberhardt
24" Walcott
24" Peltier & Johnston
24" Gould & Eberhardt
24"x24"x24" Cincinnati planer-shaper

WELDERS

7 KVA Winfield No. 36M
10 KVA Winfield Style S-18-M
47 KVA Taylor Type S-36-4
100 KVA Thomson Gibb M24-100
10 KW Federal No. 112 Jr.
20 KW Toledo Type 140
20 KW Thomson No. 240
20 KW Federal No. 124 Jr.
20 KW Taylor Moesta portage gun
175 Amp Westinghouse Arc, M.D. on cart.
300 Amp. Gibb "Zeus" transformer
35 KW Winfield butt
45 KW Agnew butt
45 KW Federal Type 8-AA
45 KW 1 1/4" Federal No. 60

WIRE MACHINERY

No. 3 RH. Magee
3/4"x 3" Shuster
3/4"x10" Shuster
1/2"x 6" Shuster
No. 1 Shuster
No. 2 Sleeper & Hartley wire reel

Write for stock list

**MILES
MACHINERY COMPANY
SAGINAW, W. S.
MICHIGAN**

BORING MILL

(POST TYPE—DOUBLE COLUMN.)

6" Spindles N-B-P. floor plate 26"x10". Also sepa-
rate Milling Attachment, three motors of 220 V. DC.
Weight 40 Tons. Excellent condition—Immediate
shipment.

TRIPLE COMB. PUNCHES & SHEARS

Pols No. 16-sp. Capacity 1 1/16"x 1/2", high gap
with triple gag punch att., for MD.
Buffalo, No. 25Ux24", cap. 1"x 1/2", for MD.

ANGLE SHEAR

6"x6"x 1/2" Kling Double Shaft, on turntable, MD.

**MARR-GALBREATH
MACHINERY CO.**
55 Water Street, PITTSBURGH, PA.

60" Niles Roller Leveler
48" Bement Rotary Planer, MD
#1 Kompsmith Universal Miller, full equipment
#3 Thiel Filing Machine
#5 Hilles & Jones Power Bending Rolls, 12" x
3/4" plate

16 x 8 Headey Geared Head Lathe, TA
24 x 10 Greaves-Klusman Lathe, new
24" Gould & Eberhardt Shaper, gear box
2-spindle Leland-Gifford Drills, MD

BUFFALO MACHINERY CO., INC.
839 Grant Street Buffalo, N. Y.

CONSIDER GOOD USED EQUIPMENT FIRST

IMMEDIATE DELIVERY IS AN IMPORTANT FACTOR TODAY

AIR COMPRESSOR

1400 cu. ft. 14"x14"x12"x16" Bury Class VCCE Motor Driven. Suitable for 100% Air Pressure

BALING PRESSES

Logemann Hydraulic, Arranged for Motor Drive. Size of Bale 7"x11"x14"
Logemann Hydraulic Style 10P, Motor Driven. Size of Bale 4"x4"x11"

BORING MILL

No. 6 Dedance Horizontal Boring Drilling & Milling Machine, 4 1/2" Spindle, Working Surface of Platen 36"x64" Arranged for Motor Drive

BUILDINGS

83 1/2"x283 1/2" with 28" Lean-to, equipped with 10 ton Niles 57' 3/4" Span Crane, Motors 440 v. 3 ph. 60 c.
92' 2 1/2"x176" with 89' 9 1/4" Crane Runway

DRAW BENCHES

20,000 lb. Brightman
25,000 lb. Brightman

GRINDER—ROLL

18"x72" Landis Roll Grinder, Complete with 25 H.P., 220 volt, 3 phase, 60 cycle Motor

PRESSES

No. 59 Toledo Straight Side, 7" Stroke, Distance between uprights 33"
No. 59 1/2 Toledo Straight Side, 10" Stroke, Distance between uprights 40"
No. 424 Hamilton Straight Side, 9" Stroke, Distance between uprights 42"
No. 8G-86 Ferracute Straight Side, 3" Stroke, Distance between uprights 64"
No. 13 Bliss Toggle Drawing, Stroke of Blankholder 15", Stroke of Punch Slide 26"; Bolster Plate 40 1/2"x39"
No. 188 1/2 Toledo Toggle Drawing, Stroke of Blankholder 18 1/2", Stroke of Punch Slide 26"; Bolster Plate 54 1/2"x50"
No. 208 1/2 Toledo Toggle Drawing, Stroke of Blankholder 15 1/2", Stroke of Punch Slide 29"; Bolster Plate 60 1/2"x84"
No. 796 1/2 Toledo Toggle Drawing, Stroke of Blankholder 21 1/2", Stroke of Punch Slide 33"; Bolster Plate 60"x108"

PRESS—HYDRAULIC

1200 ton Southwark Four Column, 48"x60" between columns, Slip Ring Motor Drive direct connected to Triplex Hydraulic Pump. Complete with Intensifier, High Pressure Piping and Valves

SAW

52" Ryerson High Speed Friction Saw, Hydraulic Feed, Motor Driven. Work Table 24"x36"

CRANES—A.C.

OVERHEAD
3 ton P. & H., 29'6" span, Motors 220/3/60
15 ton Whiting, 45' span, Motors 220/3/60
10 ton Shaw, 45'6" span, Motors 220/3/60
50 ton Shaw, 46'8" span, Motors 440/3/60
7 1/2 ton Bedford, 50' span, Motors 220/3/60
15 ton Bedford, 50' span, Motors 220/3/60
20 ton P. & H., 50' span, Motors 220/3/60
15 ton Champion, 57' span, Motors 440/3/60

CRANES—D.C.

35 ton Northern, 28' span, Motors 220 volt DC
30 ton Niles, 34'8" span, Motors 220 volt DC
25 ton Niles, 40' span, Motors 220 volt DC
10 ton 46' span, Motors 220 volt DC
10 ton Morgan, 42' span, Motors 220 volt DC
15 ton Whiting, 45' span, Motors 220 volt DC
10 ton Morgan, 48'4" span, Motors 220 volt DC
15 ton Shepard, 50' span, Motors 220 volt DC
5 ton Alliance, 50' span, Motors 220 volt DC
15 ton Shepard, 50' span, Motors 220 volt DC
25 ton Morgan, 50' span, Motors 220 volt DC
10 ton Cleveland, 58'2" span, Motors 220 volt DC
25 ton Morgan, 60' span, Motors 220 volt DC
25 ton Morgan, 500' out door runway
25 ton Morgan, 65' span, Motors 220 volt DC
25 ton P. & H., 65' span, Motors 220 volt DC
40 ton Niles, 71'11" span, Motors 220 volt DC
5 ton P. & H., 77' span, Motors 220 volt DC
20 ton Alliance, 80' span, Motors 220 volt DC
Has two 10 ton trolleys

CRANE—LADLE

75 ton Alliance, 55'0" span, Four Girder Ladle Crane with Two Trolleys. 25 ton Auxiliary Hoist, 95% New, Late Type

FORGING MACHINES

2 1/2", 4", 5" Ajax, New Model Machines
2", 3", 5" National, Steel Frame
7" Ajax, Steel Frame

HEADER

1 1/2" Acme Size C. Arranged for Motor Drive. Equipped with automatic roll feed, rivet ejector and vertical automatic release

HAMMERS—BOARD DROP

1600—2000—2500—3000 lb.
Eric—Chambersburg—Billings & Spencer

HAMMERS—STEAM DROP

3000—5000—6000—12,000 lb.
Eric—Chambersburg—Billings & Spencer

HAMMERS—STEAM FORGING

3500—4000—5000—6000—20,000 lb.
Eric—Chambersburg—Niles-Bement-Pond

HAMMER

No. 6B Nazel Hammer, Motor Driven. Capacity 7"

LEVELER—ROLLER

48" McKay 17 Roll, All Fear Driven. Machine arranged for geared motor drive. Rolls 3 1/2" dia. Capacity No. 16 gauge

SHEARS—GUILLotine TYPE

Garrison Bar Shear, Arranged for Motor Drive. Length of Blade 19 1/16", Capacity 5" Rounds
Fisher Fdry. Co. Bar Shear, Arranged for Motor Drive. Length Blade 22", Capacity 3/4" thick by 15" wide hot steel

SHEARS—SQUARING

72" Long & Allstatter, Arranged for Motor Drive. Capacity 14 ga. Spring Holdowns
96" Berisch, Arranged for Motor Drive. Capacity 10 ga. Spring Holdowns
125" Stall, Belt Driven Capacity 10 gauge Spring Holdowns
126" Hyde Park, Motor Driven, 18" Throat. Capacity 1/4" Plate
126" Lewis Fdry., Motor Driven, 24" Throat. Capacity 1/4" Plate
155" Lewis Fdry., Motor Driven, 22" Throat. Capacity 1/4" Plate

SHEAR—ROTARY

Bliss, Belt Driven, Capacity 1/4" Plate
No. 6 Quickwork, Motor Driven, 48" Throat. Capacity 3/4" Plate

SLITTER

G-36 Yoder, Motor Driven. Equipped with automatic counting attachments and complete sets of slitting knives

SWAGER

No. 6 Langeller, Arranged for individual belt motor drive. Sliding Table 22"x31". Die Size 11"x8 7/16"x3 1/4"

STRAIGHTENER

No. 2 Sutton, Arranged for geared motor drive. Capacity steel bars 1 1/2" to 3 1/2" dia. Tubes 1 1/2" to 4 1/2" dia.

STRETCHER—HYDRAULIC

30 ton Southwark, Complete with Vertical Hydraulic Triplex Pump arranged for motor drive. Will stretch rods, tubes or strips up to 35' long, capacity 1/2"x6" strips or equivalent

TESTING MACHINES

100,000 and 200,000 lb. Olsen Four Screw Universal

RITTERBUSH & COMPANY, INC., 30 CHURCH STREET, NEW YORK, N. Y.

Telephone COrtland 7-3437-3438

GEAR CUTTERS

1—72" Cincinnati type G. Cutter
1—100" Gould-Eberhardt Hobber
SHAPERS

1—24" Gould-Eberhardt, S.P.D.
2—24" American, M.D.
1—28" Columbia Shaper
1—28" Gould-Eberhardt

MILLERS

1—No. 2 Kempsmith Universal
1—No. 2-A Brown & Sharpe Univ., M. D.
1—No. 2 Cincinnati Vertical
1—No. 4 Cincinnati Vertical
1—No. 5 Cincinnati Plain
1—No. 4 Kempsmith Maxi Mill
1—No. 3-S Cincinnati Plain

LATHES

1—76"x52" Putnam, G. Hd., M.D.
1—65"x32" Bement Niles Heavy Duty
1—56"x18" N-B-Pond Heavy Duty
1—30"x16" Houston-G-Gambel
1—14"x8" Lodge-Shiley, G. Hd.

BORING MILLS

1—No. 1 and No. 2 Barrett Horizontal
1—36" Bullard Rapid Production
1—51" Baugh Vertical
1—33" Calburn Vertical
1—62" Niles Vertical
1—72" Niles Vertical
2—60" Boits Vertical
1—6" Espen Lucas

PLANERS

1—72"x72"x12" N-B-Pond, M.D.
1—56"x56"x14" Gray
1—48"x48"x18" Cincinnati, M.D.
1—48"x48"x16" Sellers, M.D.
1—48"x48"x14" N-B-Pond, M.D.
1—42"x42"x22" Cincinnati, M.D.
1—36"x36"x14" Gray, M.D.

GRINDERS

1—14" Pratt-Whitney Vert.
1—No. 24 Gardner Disc
1—18"x84" Landis Plain

SIMMONS MACHINE TOOL CORP.
ALBANY, N. Y. New York City, 149 Broadway

UNUSUAL TOOLS

Our location in Detroit keeps our Organization in constant touch with the largest selection of machine tools in the world.

AUTOMATICS, Gridley 2 1/4" Mtlpe, Spindle (7)
AUTOMATICS, Case 1 1/2", M.D.
FURNACE, Home Electric
GRINDERS, No. 13 B. & S. Univ. (3)
GRINDER, No. 2 Cincinnati Univ.
GRINDER, Pratt & Whitney, Surface, Ball Brgs., M.D.
GRINDER, No. 3 Abrasive, Surface
GRINDER, No. 70 Head, Internal
GRINDER, No. 70 Head, Double, Double Spindle
GRINDERS, No. 72 Head, M.D., Hyd. Feed (3)
GRINDER, Helm Centerless, M.D.
GRINDER, Gardner Opposed Type, Auto. Feed, M.D.
HOBBER, No. 18HS Gould & Eberhardt, S.P.D.
LATHE, 30x10 Reed, M.D.
MILL, 2 1/2" Cincinnati Boring, S.M.D.
MILL, No. 30H Hendey Univ., S.P.D.
OIL GROOVER, Wisco, late type
PLANNER, 60"x60"x14" Niles-Bement-Pond
PLANNER, 30"x30"x10" Liberty Opposite, Motor Driven, with motor, 1 rail head and 1 side head
PRESS, No. 4D Bliss, Double Crank, Tie Rod, 12" stroke, 19" sh. ht., 34"x68" bel. Twin Drive
PRESSES, 10 and 30 ton Henry & Wrights, M.D.
SHEAR, 10", 1/2" United Eng'g, M.D.
SHEAR, 10", 3/4" Pittsburgh, M.D.
SLOTTER, 16" Boits, M.D., like new, latest type
WELDERS, Spac. Seam, Best

And a complete stock of up-to-date rebuilt equipment.

HARVEY GOLDMAN & CO.
Machinery

10567 Gratiot Ave., Detroit, Mich.

AUTOMATICS

For Immediate Delivery

Cleveland 4 1/2" Model "M" 4-Spindle Chucking Machine, M.D. by 10 H.P. 3-60-220.

Cleveland 4-Spindle 1 1/2" Chucking Machine, M.D.

National-Acme No. 56 2 1/4" 4-Spindle.

Gridley 4-Spindle 4 1/2" Automatic Chucking Machine, Model "H", M.D.

1 3/4" Gridley 4-Spindle, Model "F".

2 1/4" Gridley Single Spindle, M.D.

No. 6-A & 5-A Potter & Johnston's.

14" Fay Automatics with back angle attachment.

Many other high grade machines.

INDUSTRIAL MACHINERY COMPANY
2100-2300 Fletcher Ave., Indianapolis, Ind.
Drexel 3306.

26" x 48" x 24'
McCabe, 2 Spindle Lathe

AARON MACHINERY CO.
176 Lafayette St., N. Y. C.

24" SLOTTER
NILES - BEMENT - POND
MOTOR DRIVE

ROSENKRANZ WEISBECKER & Co., Inc.
149 BROADWAY, N. Y. C.

VICTOR'S BARGAINS
In New Small Tools

High speed and carbon drills, taps, reamers, milling cutters, hollow mills, end mills, drill rod, etc. All made in U. S. A.
Send for our Catalogue.
VICTOR MACHINERY EXCHANGE
251 Centre St., New York, N. Y.

"Reasons Why 'First' The Iron Age is First"

4,061 pages of editorial articles, industrial news, prices and statistics appeared in The Iron Age during 1936.

Over 82% of the manufacturers subscribing to The Iron Age renew year after year at \$6 per annum. This renewal percentage represents reader interest.

The circulation is fully paid. In getting \$6 per annum The Iron Age assures the advertiser contact with the buyers. If they didn't use The Iron Age as a working tool they wouldn't pay \$6 a year to get it.

600 manufacturers are running regularly on a yearly contract.

4,372 advertising pages were used for their selling messages during 1936.

In surveys made by 44 manufacturers to ascertain "What publications do you use most in your business?" The Iron Age landed in first place 34 times. One other publication landed in first place 10 times. The others in the field never landed in first place in these surveys.

The Iron Age is the metal-working industry's "FIRST" in the number of advertisers and advertising volume, reader volume (over 70,000 metal-working executives read The Iron Age weekly), in the amount of editorial matter published, prestige, reader-interest and advertising power.

Are any other facts necessary to prove that The Iron Age is the most outstanding advertising "buy" in the metal-working field for 1937?

THE CLEARING HOUSE

Air Compressor—Laidlaw-Dunn-Gordon 12"x14" M.D. Duplex Single Stage.
Soring Mill—Espan-Lucas No. 26—4" Bar Floor Type
Broach—Foote-Burt No. 1, M.D. Vertical Hyd.
Dieing Machine—(2) 25 Ton Henry & Wright with Scrap Cutter, M.D.
Drill—Niles 6" Universal Radial.
Drill—Pratt & Whitney No. 11 Mult. Spdl.
Gear Shapers—Fellows No. 7—High Speed (2).
Grinders—Brown & Sharpe No. 10, No. 11 Plain.
Grinder—Heald No. 70 Internal.
Grinder—Queen City 16"x12" Pl. Cyl.
Grinder—Pratt & Whitney 14" B.B. Vert. Sur.
Grinder—Badger No. 221 Disc.
Lathe—Warner & Swasey No. 2A Turret.
Lathe—Whitcomb-Blaisdell 20"x24" Q.C.G.
Millers—(2) Milwaukee No. 2B Double Overarm Plain.
Miller—Milwaukee No. 2 1/2 B. Vertical.
Miller—Bocker No. 6 Vertical.
Miller—Potter & Johnston No. 2M.
Miller—Milwaukee No. 1 1/2 B. Double Overarm S.P.D. Universal.
Miller—Van Norman No. 1/4, No. 2 Duplex.
Planer—Niles-Bement-Pond 42"x42"x18"—M.D. Four Head.
Saw—Feetless 13"x13" Univ. Shaping.
Screw Machines—(30) Brown & Sharpe No. 00, No. 0, No. 2 Automatics.
Screw Machine—Brown & Sharpe No. 00 High Speed Auto.
Screw Machines—(3) Cone 1 1/4".
Screw Machines—Davenport No. 2.
Screw Machines—New Britain No. 652.
Shapers—(2) Pratt & Whitney Vertical (1-6", 1-10").
Shear—Niagara No. 772.
Tester—Richle 100,000 Lb. M.D. Hardness.
Thread Roller—Waterbury-Farrel No. 4 Screw.

HOTWINK BROS., INC.
MACHINERY
NEW HAVEN, CONNECTICUT

No. 8—Buffalo "Armor Plate" Bar Cutter—95% new.
11" Stoll Motor Driven Power Shear—capacity 14 Ga.
24" x 12" Lodge & Shipley Crank—Shaft Lathe.
30" x 30" x 10" Cleveland Open Side Planer, 3 heads.
48" x 48" x 12" Cleveland Open Side Planer, 2 heads.
Ingersoll Miller, 56" x 36" x 10", 4 heads.
No. 5-A Lees-Bradner Gear Generator.
No. 1/4—Buffalo "Universal" Iron Worker.
THE E. L. ESSLEY MACHINERY CO.
829 Rees Street, Chicago, Ill.

ENGINE LATHE
66" x 30" JOHNSON
Cone Drive
Heavy Duty
ROSENKRANZ, WEISBECKER & Co., Inc.
149 BROADWAY, N. Y. C.

Bulldozer, No. 9 Williams-White
Drill, No. 4 Colburn four spindle, Mfg. type, 2" capacity, like new.
Grinder, No. 3 12 x 44" Landis Univ.
Hammer, 300 lb. Beaudry Upright, belt
Hammer, 250 lb. Chambersburg Board Drop Press, No. 3 1/2-B Bliss, Toggle
RELIANCE MACHINERY SALES COMPANY
1405 Brighton Place, N.S., Pittsburgh, Pa.

MONARCH ENGINE LATHE 24" x 20' Quick Change, Taper Attachment.
GOULD & EBERHARDT CRANK SHAPER—28" Cone Drive.
BROWN & SHARPE GEAR CUTTER No. 5—60".
BARBER COLMAN GEAR HOBBS No. 3 & 12.
WARNER & SWASEY TURRET LATHE No. 4 Plain & Universal.
DIAMOND SURFACE GRINDER 16 x 50 Belt Driven.
GARDNER No. 24 HORIZONTAL DISC GRINDER 53".
INDIANAPOLIS MACHINERY & SUPPLY CO., INC.
1900-70 South Meridian Street, Indianapolis, Indiana

Specializing In
GORTON - DECKEL
ENGRAVING MACHINES
AARON MACHINERY CO.
176 Lafayette St., N. Y. C.

72" X 60" X 18"
OPENSIDE PLANER
DETTRICK & HARVEY—Motor Drive
BENNETT-BAKIN MACHINERY CORP.
30 Church St. New York, N. Y.

No. 3A Universal 3" Horizontal Boring Mill.
4 sp. Island-Gifford N.S. Drill, 12" overhang.
No. 3 taper, never feed on each spindle.
No. 14 Cochrane Bly Duplex Universal Vertical Mill and Shaper.
No. 2 Kopp Smith Maximillor, S.P.D.
No. 2 1/2 B. K. T. Vertical Millor, S.P.D.
No. 3 Oilgear Hydraulic Broaching Machine, type XA.
VICTOR MACHINERY COMPANY
130 S. Clinton St. Chicago, Illinois

8 ft. RADIAL DRILL
Cincinnati Bickford
Enclosed Head — Motor Drive
SUN MACHINERY COMPANY
115 HANFORD ST., NEWARK, N. J.

PI CRAWFORD
30 CHURCH ST. - NEW YORK
STEEL MILL EQUIPMENT

INDUSTRIAL PLANTS
ROLLING MILLS and EQUIPMENT
FRANK B. FOSTER
829 OLIVER BUILDING PITTSBURGH PA
Cable Address FOSTER Pittsburgh

No. 2 Cincinnati and No. 2 1/2 LeBlond Universal Millers and equipment, Cincinnati No. 4 Plain Miller and counter shaft, Gardner No. 3 Dual Wet Tool Grinder, M.D., 12 extra wheels—3 yrs. old—used one month; Becker Model C Vertical Miller, power feeds in all directions; Putnam 18 x 10 x 35 x 16 Gap Lathe, Ratchet feed, sliding bed, Q.C.G., D.B.G., with 14" four jaw chuck, regular equipment and counter shaft; Industrial Works Railroad Crane, 8 wheel Oil Burner, 30,000 lb. cap. 45 ft. boom; Powell Planer 48 x 48 x 16—2 heads on cross rail—one head on each side; 2 & H No. 7 Toggle Press, M.D.; Lathes: Hendey 14" x 12" G.H. M.D.; Hendey 24" x 12" and counter shaft; Hamilton 18" x 8" G.H. M.D.; Rockford 18" x 8" Q.C. and counter shaft; Sebastian 16" x 8" L.C. G.B.; 16" D. B.G. Shaper; Standard No. 1 Automatic Drop Hammer, Peis Combination Shear and Peis Punch, Bausch 40" Boring Mill; Radial Drill Presses, 3 1/2 ft. S.P.D.; Drill Presses B.G. & B.B.; Drill Press, Multi-Spindle; Arc Welder 300 Amp.; Power Presses and Foot Presses, Air Compressors, several other machine tools.

WALTER WALKER

50 EDISON PLACE NEWARK, N. J.

HORNING PRESSES
30—No. 16 BLISS



Either belt or geared motor drive with swing ing adjustable table.

Weight 1300 lbs.

Stroke 1 1/2"

Purchased new in 1929

Excellent condition

J. N. MOYER

471 North 5th St., Philadelphia, Pa.

POWER PRESSES
BLISS, FOR FINE V & O ETC
REDUCTION GUARANTEED
JOSEPH HYMAN & SONS
1234 LEXINGTON AVE. NEW YORK 17, N.Y.

POWER PRESSES
MACHINERY FOR
Tin Can Making and Metal Working
Wire Drawing, Forming, Straightening, Rivet, Nail and Bolt Making, etc.
Electric Spot, Butt and Seam Welders.
Power Presses of every description.
NATIONAL MACHINERY EXCHANGE
"If It's Machinery—We Have It"
128-135 Mott St. New York, N. Y.

CAN MAKING MACHINERY
Bliss No. 620 Automatic Strip Feed Presses
McDonald No. 31 Automatic Strip Feed Presses
Lohn Wash Sifter
Scanners—Bodymakers—Flangers—Slitters—Tosters
R. & S. MACHINERY CO.
19 Howard St., New York City

IN PHILADELPHIA STOCK
BORING MILL
3' Rockford Horizontal, Single Pulley Drive
FRANK J. LUNNEY
Metal Working Machinery
953 N. FRONT STREET PHILADELPHIA, PA.

100" BORING MILL
Niles Bement Pond Vertical, motor drive, rapid traverse, 96" table, 82" under rail.
THE O'BRIEN MACHINERY CO.
113 N. THIRD ST., PHILA., PA.

*Used Machines
Are Quickly "Cleared"
Through These Columns*

MULTIPLE PUNCH: Long & Allstatter, 350 ton Cap., 10 ft. between housings.
DOUBLE ANGLE SHEARS, Kling 6" x 6" x 1"; 8" x 8" x 1"
PLATE PLANNER: Hilles & Jones No. 4.
BULLDOZERS: Nos. 1, 2, 3, 4, 23, 25 and 26. Also No. 24 Vertical Williams White.
UPSETTING and FORGING MACHINES: 1/4" to 7"
AJAX UPSETTER: 2" Late Type
5000 LB. ERIE DOUBLE FRAME FORGING HAMMER
4000 LB. CHAMBERSBURG STEAM DROP
NAZEL HAMMERS, Nos. 3B and 4B
BUFFALO BAR SHEAR, No. 8 for rounds, flats and structural shapes
H & J Straightening Rolls, 1/4" x 4 ft.
400 TON WHEEL PRESS
PRESSES: Solid Back and Inclined Nos. 1, 2, 3 and 4. Also Trimming Presses.
TENSILE TESTERS: 20,000, 40,000, 100,000, 200,000 and 300,000 lbs.
WIRE STRAIGHTENERS: 1/4" to 5/8"
THREADING MACHINES: 1/4" to 3", Single and Double Spindle, Lead Screws
LANDIS 6" Pipe Threader, M.D.
D & K BENDING BRAKES: 10' x 3/16" and 10' x 1/8" ga. pan.
NIAGARA SHEAR 10' x 18 ga.
AIR COMPRESSORS and SAND-BLASTS
BOLT, NUT and RIVET MACHINES: Cold and Hot Headers; Cold and Hot Nut Machines; Threaders; Trimmers; Thread Rollers; Slotters; Stud Threaders; Tappers; Burring Machines, etc.
DONAHUE STEEL PRODUCTS CO.
 74th St. & Ashland Ave. Chicago, Ill.

BRADLEY HAMMERS
300 lb. Upright Helve
SUN MACHINERY COMPANY
 115 HANFORD ST., NEWARK, N. J.

ARC WELDERS
 200 amp. Lincoln A.C. drive 3-60-220/440
 200 amp. West A.C. drive 3-60-220/440
 300 amp. Lincoln A.C. drive 2-60-220/440
 300 amp. Lincoln A.C. drive 3-60-220/440
 300 amp. Lincoln 220 volt D.C. drive
GOODMAN ELECTRIC MACHINERY CO.
 1060 Broad St. Newark, N. J.

GUARANTEED Rebuilt Welders
 Completely rebuilt, modernized and performance tested. **REAL MONEY**
SAVING PRICES. Get full details and Low Prices from Morocco before you buy. Stock—all sizes—standard makes. We buy, sell, and exchange.
THE MOTOR REPAIR & MFG. CO.
 1553 Hamilton Ave. Cleveland, O.

AIR COMPRESSORS
New and Remanufactured
Compressor Builders for 35 Years
 In Stock at Our Plant—150 Modern Compressors All Makes and Sizes—Shop Tested—Guaranteed
AMERICAN AIR COMPRESSOR CORP.
 558 Hamilton Avenue, Brooklyn, New York

AIR COMPRESSORS IN STOCK
 2600 ft. Sullivan WN4 Duplex Electric.
 807 ft. Ingersoll-Rand XCB, Belted.
 676 ft. Ingersoll-Rand XCB, Belted.
 546 ft. Ingersoll-Rand ERI, Belted.
 9 Low Pres. 168 ft., 710 ft., 1200 ft.
 2200 ft. Steam, Belted & Elec. Drives.
R. C. STANHOPE, INC.
 875 Sixth Ave. New York, N. Y.

COMPRESSORS
WJ3 Sullivan, 694 cu. ft.
Ingersoll Rand, 446 cu. ft.
Elec. Motors 3/60/440—20 HP, 40 HP
J. T. WALSH
 Brisbane Bldg. Buffalo, N. Y.

"Anything so long as it contains IRON or STEEL"
IRON & STEEL PRODUCTS, Inc.
BUYERS SELLERS TRADERS
Railway Exchange Chicago

FOR SALE
CARS AND LOCOMOTIVES
CAR REPAIR PARTS
WESTERN AIR DUMP CARS
 Three, 10-yd., built 1927, steel, in unusually good condition
 Four, 12-yd., wood, fair condition
6 1/2 YD.-ELECTRIC STRIPPING SHOVEL
 BUCYRUS 320-B, 2200/4000 volts, 3 ph., 60 cycles, A.C. 250' belt, Ward-Leonard control, 90 ft. boom and 58 ft. dipper stick. Built in 1925 and used only two years, and in good condition. Located near Madisonville, Ky. Part cash; terms if necessary.
1 1/2-TON SWINDELL ELECTRIC FURNACE
 Completely Overhauled. As Good as New
TRUSCON BUILDING 50'x185'
 Complete with steel sheeting, sash and doors. Easily re-erected.
BUILDINGS, OVERHEAD, GANTRY, AND LOCOMOTIVE CRANES

WANTED
STEEL BUILDINGS
 ANY SIZE OR LOCATION
CRANES:
OVERHEAD, GANTRY & LOCOMOTIVE
GANTRY CRANES:
 10 to 15 ton 125' to 150' span with 30' to 40' cantilever one end 30' to 40' lift 230V, D.C. 7 1/2 to 10 ton 200' to 225' span with 2 cantilevers one 80' to 90'—other 50' to 60'. Lift 60' to 70' 230V, D.C.
ELECTRIC FURNACES FOR STEEL MELTING

SURPLUS MACHINERY AND MOTORS

H.P.	Speed	Volts	Make	Price
2-400 3 ph.	60 cy.	500	2200 Westinghouse	\$800
1-450 3 ph.	60 cy.	514	550 G.E.	\$950
5-15 D. C.	500/1000	550 G.E.	.....	290
2-20 D. C.	500/1000	550 G.E.	.....	340
1-Rock River Punch, 48" Throat, Architectural Jaw.	Price	.....	.....	850
1-15-Ton Morgan Crane, 68' Span.....	.....	.....	.....	.....
2-15-Ton Morgan Crane, 52' Span.....	.....	.....	.....	.....
1-5-Ton Universal Crane, 1/4 yard Williams Bucket, Gas Driven Motor, mounted on White Truck .....	.....	.....	.....	3,500
1-50-Ton Industrial Bay City Wreck Crane .....	.....	.....	.....	4,500
1-20-Ton Browning Loco. Crane.....	.....	.....	.....	4,000
1-25-Ton Industrial Bay City Loco. Crane .....	.....	.....	.....	5,000
1-20-Ton McKyley Loco. Crane .....	.....	.....	.....	4,000
1-15-Ton Browning Loco. Crane .....	.....	.....	.....	3,500

HUNTER STEEL COMPANY
 3200 Grand Avenue Phone Federal 4300
 Neville Island Pittsburgh, Penna.

FOR SALE
 Heating plant with boilers and automatic Detroit stokers. 150 H.P., 150 lb. capacity pressure for each boiler. Ohio Standard, pass Ohio Inspection Code. Size 72" x 18". Cheap. In good condition.
FORT PITT STEEL CORP.
 397 Phillips Avenue, Toledo, Ohio

MODERN AIR COMPRESSORS
 All Types and Sizes
 Rebuilt-Guaranteed
EARL E. KNOX COMPANY
 8 West Second St. Erie, Pa.

SPECIALS

- 1-250 K.W. Ridgeway D.C. Generator, 250 Volt, 500 R.P.M.
- 1-100 K.W. General Electric 250 Volt D.C. motor generator, 3 bearing unit on cast iron base, 900 R.P.M.
- 1-100 K.W. General Electric 125 Volt D.C. motor generator, 3 bearing unit on cast iron base synchronous motor, 1200 R.P.M.
- 1-100 K.W. Elliott Co., Synchronous Rotary Converted A.C. End—6 phase, 60 cycle.
- 4150 Y 2300 1200 R.P.M. D.C. End—250 volts—with transformers. New.
- 1-150 HP. General Electric Type 1—3 ph. 60 cycle 220 volt—720 R.P.M.
- 1-100 HP. General Electric type KT 356 3 ph. 60 cycle—900 R.P.M.
- 1-100 HP. Westinghouse—3 ph.—60 cycle 440 volt—700 R.P.M.
- 1-75 HP. Westinghouse type C S—3 ph.—60 cycle 220 volt—1150 R.P.M.

1 Year Guarantee

L. J. LAND—Est. 1910
 140 GRAND STREET, NEW YORK, N. Y.
 New York City's Largest Stock

A.C. MOTORS—3 Phase, 60 Cycle

H.P.	Make	Volts	Type	Speed
1500	G.E.	440/220	ATI-Synch.	150
500	G.E.	440	Synch.	1200
450	West.	440/220	Synch.	257
450/360	West.	2200	CW-Silpring	875/700
400	West.	2200	CW-Silpring	290
400	G.E.	4150/2300	MT-Silpring	390
400	West.	2300	CW-Silpring	514
300	Al. Chal.	2200	ANY-Silpring	585
300	West.	440/220	CW-Silpring	1800
250	G.E.	4000/2300	MT-Silpring	257
250	CR. WH.	440/220	122Q-Silpring	435
250	West.	440/220	CW-Silpring	585
225	Elec. Mehry.	4150/2300	3-BRG.-Synch.	450
220	G.E.	440/220	ATI-Synch.	600

Large Stock of FULLY GUARANTEED a.c. and d.c. MOTORS—GENERATORS—TRANSFORMERS and ELECTRICAL EQUIPMENT
BELYEA COMPANY
 Incorporated
 147 W. 18th St. New York City

USED STEAM AND ELECTRICAL EQUIPMENT

Steam Turbines, Motor Generator Sets, Belted and Direct Connected A.C. and D.C. Generating Units, Boilers, Rotary Converters, Motors, Transformers, Etc.
ARCHER & BALDWIN, INC.
 75 West Street, New York
 Tel.—Bowling Green 9-9275—9276

Profit by using

THE CLASSIFIED SECTIONS

of The Iron Age

THE CLEARING HOUSE

FOR SALE

1—Steam Self-Propelling Locomotive Crane, first class condition. Also, 400 H.P. A.C. Motor.

WYLIE-STEWART MACHINERY CO.
Okla. City, Okla.

ELECTRIC HOISTS—CRANES

Bought—Sold—Rented

ELECTRIC HOIST & MOTOR CO.
149 N. 9th ST. BROOKLYN, N. Y.

MODERN OVERHEAD TRAVELING CRANES MONORAIL SYSTEMS & HOISTS

New and Rebuilt and Guaranteed

VICTOR R. BROWNING & CO., INC.
WILLOUGHBY, OHIO (CLEVELAND SUBURB)

FOR SALE

LOCOMOTIVE CRANE

15 ton Browning eight wheel, code boiler, 50 ft. boom.

In operating condition. Will sell reasonable. Can be inspected under steam.

STANDARD STEAM WINCH & HOIST COMPANY
Fort Mifflin, Phila., Pa.

- 1—25 Ton P. & H. Crane DC 65' span.
- 1—3 Ton Shaw Crane 110 DC 47' 7" span.
- 1—5 Ton Shepard Crane 110 DC 70' span.
- 1—10 Ton Box Crane DC 30' span.
- 1—8 Ton Champion Crane AC 30' span.
- 1—15 Ton Morgan Crane DC 60' span.
- 1—40 Ton Niles Crane DC 72' span.
- 3—15 Ton Shaw Cranes DC 30' span.
- 1—Putnam Car Wheel Borer.
- 1—400 Ton R.D. Wood Wheel Press.

SEVERIN MACHINERY CO.
30 Church St., New York City

OVERHEAD CRANES & HOISTS

- 20 Cranes—one plant, 3 to 40-ton capacity, 16'9" to 75'0" span, 230 volts D.C.
- 1—7½-ton Morgan, 3-motor, 65'0" span, steel mill design, 220 vo. D.C.
- 1—3-ton, P. & H. 3-motor, 28'0" span, 220 vo., 3 ph., 60 cy.
- 2—35-ton Girders 60'0" span.

Send me your crane and hoist inquiries.

JAMES P. ARMEL, 925 Fulton Bldg., Pittsburgh, Pa.

LIFTING MAGNETS

20"-24"-36"-45"

We furnish completely rewound magnets guaranteed for one year. We buy, sell, rent and repair magnets.

GOODMAN ELECTRIC MACHINERY CO.
1060 Broad St., Newark, N. J.

EQUIPMENT

26—12 yd. Western Air or Hand Dump Cars
11—50 ton 40 ft. Flat Cars
8—50 ton 40 ft. Steel Gondolas
22—50 ton Steel Hopper Coal Cars
1—25 ton Browning Locomotive Crane
1—20 ton Ohio Locomotive Crane
2—40 ton Baldwin 4-Driver S.T. Locomotives
12—5 yd. 36" ga. Western Dump Cars
3—1½ yd. 36" ga. Koppel V Dump Cars
Cars and Locomotives of all types.

HYMAN-MICHAELS CO.

20 N. Wacker Drive Bldg., Chicago
Ry. Exchange Bldg. 101 West 31st St.
St. Louis, Mo. New York

STEEL BEAMS

used, in good condition

Both lots in 28'0" and 25'6" lengths

1000 Tons 20" Lackawanna, 6¼" flange, 65 lbs. per foot.

1000 Tons 20" Bethlehem, 8" flange, 59 lbs. per foot.

ROCKDALE MILL, INC.

P. O. Box 659 New Bedford, Mass.

Second Hand Wrought Iron and Steel PIPE

Overhauled
Rethreaded
Coupled

All Sizes in Stock

Greenpoint Iron & Pipe Co., Inc.
Stagg & Bogart Sts., Brooklyn, N. Y.

RR NEW-USED RECLAIMED
ALBERT PIPE SUPPLY CO. Inc.
Borough and North 13th St. Brooklyn, N. Y.

ALBERT & DAVIDSON PIPE CORP.
PIPE NEW-USED-UNTESTED
2nd Ave 50th 51st St. EST. 1904 Brooklyn, N. Y.

HOT ROLLED SHEET STEEL DRY SECONDS

14 GA.

24 x 96 4,600 lbs.

18 GA.

15 x 71½ 6,500 lbs.
15½ x 76¼ 11,500 "
24 x 96 7,300 "
34 x 57¼ 125 "
35 x 61½ 3,500 "

19 GA.

12½ x 62 4,200 lbs.
21½ x 71¼ 993 "
27 11/16 x 61½ 16,000 "
28½ x 51 536 "
31½ x 57¼ 200 "
33 x 71¼ 3,000 "
34 x 57¼ 725 "
36½ x 71¼ 2,800 "

20 GA.

12 x 44¼ 1,900 lbs.

22 GA.

11½ x 57¼ 1,200 lbs.

28 GA.

17½ x 45¼ 8,000 lbs.
18 x 58 387 "
24½ x 72 6,000 "
31½ x 72 2,000 "

Write, Telegraph, Telephone

MERCHANTS STEEL CORP.

212-214 VAN BRUNT ST.
BROOKLYN, N. Y.
Telephone TRIangle 5-0769

RAILS **1 Ton or 1000**

NEW RAILS—5000 tons—All Sections—All Sizes.
RELAYING RAILS—35,000 tons—All Sections—All Sizes, practically as good as New.
ACCESSORIES—Every Track Accessory carried in stock—Angle and Splice Bars, Bolts, Nuts, Frogs, Switches, Tie Plates.
Buy from One Source—Save Time and Money.
Phone, Write or Wire.

L. B. FOSTER COMPANY, Inc.
PITTSBURGH NEW YORK CHICAGO

RAILS

All sections new and relaying rail, spikes, bolts, frogs, switches, contractors' cars, etc. Prices cheerfully quoted.

M. K. FRANK

400 Lexington Ave., New York City 25 St. Nicholas Bldg., Pittsburgh, Penna.

WANTED

WANTED

TWO ARC MELTING FURNACES in good operating condition with capacity of 500 to 1000 lbs. and from 1 to 3 tons.

Address Box S-263
Care The Iron Age, 239 W. 39th St., New York

Material Wanted

We need steel bars, new or old, of the following sizes, 1x4, 1x6, 1x8, 1½x8 random lengths.

ADDRESS BOX S-255
Care The Iron Age, 239 W. 39th St., New York

WANTED

Your Inquiries and Offerings

Your perusal of our SPECIAL advertisement on page 178 of this Classified Section.

It may "pay" you to do so!

IRON & STEEL PRODUCTS, INC.
Railway Exchange Chicago, Ill.
"Anything so long as it contains IRON or STEEL!"

WANTED TO BUY

SURPLUS AND OBSOLETE LOTS
SHEET STEEL, TINMILL
PRODUCTS, STRIP STEEL

ADDRESS BOX S-249
Care The Iron Age, 239 W. 39th St., New York

MIDLAND STEEL & EQUIPMENT CO.
400 South Clinton Street, Chicago, Illinois

The
Largest Buyers
of
Surplus Steel Inventories

WRECKING

We will purchase and dismantle any size plant. Also purchase motors, generators and electric equipment of every description.

GEORGE STEINER

1231 West Lake St., Chicago, Ill.

CONTRACT MANUFACTURING

CONTRACT MACHINE WORK

Parts and complete machines
Mail blue prints for quotations

THE FRANKLIN MFG. CO.
133 Mill River St., New Haven, Conn.

SCREW MACHINE PRODUCTS

OF EVERY DESCRIPTION
SMALLEST UP TO 2 1/4"
HARDWARE SPECIALTIES

OLSON MFG. CO.
Worcester, Mass.

Diamite and Moly-iron

Castings

We specialize in Alloy Iron Castings,
Finish Grinding and Machine Work.

Weatherly Foundry & Manufacturing Co.
WEATHERLY, PA.

BRASS AND BRONZE CASTINGS

1 lb. to 4000 lbs.
Capacity 16,000 lbs. per day
OUR SPECIALTIES

WORM AND GEAR BRONZE, BRIDGE
BRONZE, ACID PROOF BRONZE,
BRONZTOX BUSHINGS AND BARS.
A. W. CADMAN MFG. CO., Pittsburgh, Pa.
Established 1860

ALLOY IRON CASTINGS

a specialty

CONTRACT MACHINE WORK
requiring large machine tools
MURRAY IRON WORKS COMPANY
BURLINGTON, IOWA

STAMPINGS

Light and Medium
Electric Spot Welding and
Assembled Units

We specialize in designing stampings to substitute castings. Dies designed and built for quantity production.

Eastern Tool & Stamping Co., Inc.
39 Ballard Street, Saugus, Mass.

HOT DIP GALVANIZING

We have the largest hot dip galvanizing plant and kettles in the United States. We have the most modern equipment to do first class galvanizing at lowest prices. Prime Western Zinc used exclusively. Galvanized products furnished.

Send Us Your Inquiries

Joseph P. Cattie & Brothers
Gaul and Letterly Streets
Philadelphia

DROP FORGINGS

LIGHT AND
MEDIUM
WEIGHT

Also Drop
Forging and
Trimming
DIES
Made to
Order

THE HARTFORD DROP FORGE CO.
HARTFORD, CONN.

BUSINESS OPPORTUNITIES

FOR SALE

FACTORY SITE; Central Ohio; Situated in small community of 2000; comprises 8 acres; steel wire fence all around; railroad siding; brick office building; steel factory buildings; tile and cement warehouse buildings; water, fuel and labor; ideal. Further information and details can be had by communicating with **The I. A. Barnett Company,** Barberton, Ohio.

SOMEWHERE

There Is A Manufacturer

of Machinery who could greatly increase profits and reduce costs by combining his facilities with us. We have a modern, centrally located plant with siding. We build machinery and have unused 14,000 square feet available plus machine, woodworking and forge departments.

ADDRESS BOX S-244

Care The Iron Age, 239 W. 39th St., New York

PLANT FOR SALE

Industrial Plant, excellent for structural steel, plate steel work, heavy machinery, etc. Cranes up to 75 ft. span. 30 ton capacity. Located in Delaware, where compensation insurance rates, taxes and labor conditions are very favorable. Over 8 acres of land. Priced to sell.

Why lose valuable time building at top prices, when this plant can be purchased for a fraction of the cost of reproduction?

Many Other Properties Throughout the East

EDWARD H. ZOLL, INC.

Specialists in Industrial Properties

196 MARKET ST. NEWARK, N. J.
Tel. Market 3-4537

Active 21-year-old Fresno fabrication business for sale. Complete, modern equipment for tank manufacture and contract welding. Now employs 20 men. Building 100' x 150'. Clientele of 150 mile radius. Will support two or three partners. Demand for our welded products is growing. Write Wm. M. Myers, 1801 Santa Clara St., Fresno, Calif.

FOR SALE

ATTENTION FOUNDRY MEN

In City of 11,000 located 45 miles west of Milwaukee, Wis. Foundry is equipped with two furnaces 5 & 20 ton. Traveling electric crane, Rattlers, Core room & ovens, Blower & exhaust fans, all set to go. About 35,000 ft. of floor space including machine shop, good R. R. siding for loading & receiving, for further information write

GEO. N. HARTMAN

506 Third St., Watertown, Wis.

BRAZIL: A Brazilian, owner of 90,000 acres of land in Maranhão that has been surveyed by the Federal Government, and found rich in manganese and aluminum ores, is anxious to make connections with American capital to develop this land. Splendid opportunity. Full details given to interested parties. Caixa Postal 1535, São Paulo, Brazil.

Procurement Division, Public Buildings Branch, Washington, D. C., June 15, 1937.—Sealed proposals in duplicate will be publicly opened in this office at 1 P. M., July 29, 1937, for construction of the U. S. P. O. at Ballinger, Texas. Upon application, one set of drawings and specifications will be supplied free to each General Contractor interested in submitting a proposal. The above drawings and specifications MUST be returned to this office. Contractors requiring additional sets may obtain them by purchase from this office at a cost of \$5 per set, which will not be returned. Checks offered as payment for drawings and specifications must be made payable to the order of the Treasurer, U. S. Drawings and specifications will not be furnished to Contractors who have consistently failed to submit proposals. One set upon request, and when considered in the interests of the Government, will be furnished, in the discretion of the Assistant Director, to builders' exchanges, chambers of commerce or other organizations who will guarantee to make them available for any Sub-contractor or material firm interested, and to quantity surveyors, but this privilege will be withdrawn if the sets are not returned after they have accomplished their purpose. W. E. Reynolds, Assistant Director of Procurement, Public Buildings Branch.

Procurement Division, Public Buildings Branch, Washington, D. C., June 25, 1937.—Sealed proposals in duplicate will be publicly opened in this office at 1 P. M., July 28, 1937, for construction of the U. S. Agriculture and P. O. at Oneonta, Ala. Upon application, one set of drawings and specifications will be supplied free to each General Contractor interested in submitting a proposal. The above drawings and specifications MUST be returned to this office. Contractors requiring additional sets may obtain them by purchase from this office at a cost of \$5 per set, which will not be returned. Checks offered as payment for drawings and specifications must be made payable to the order of the Treasurer, U. S. Drawings and specifications will not be furnished to Contractors who have consistently failed to submit proposals. One set upon request, and when considered in the interests of the Government, will be furnished, in the discretion of the Assistant Director, to builders' exchanges, chambers of commerce or other organizations who will guarantee to make them available for any Sub-contractor or material firm interested, and to quantity surveyors, but this privilege will be withdrawn if the sets are not returned after they have accomplished their purpose. W. E. Reynolds, Assistant Director of Procurement, Public Buildings Branch.

Procurement Division, Public Buildings Branch, Washington, D. C., June 17, 1937.—Sealed proposals in duplicate will be publicly opened in this office at 1 P. M., July 23, 1937, for furnishing all labor and materials and performing all work for construction of the U. S. P. O. at Gunnison, Colo. Upon application, one set of drawings and specifications will be supplied free to each General Contractor interested in submitting a proposal. The above drawings and specifications MUST be returned to this office. Contractors requiring additional sets may obtain them by purchase from this office at a cost of \$5 per set, which will not be returned. Checks offered as payment for drawings and specifications must be made payable to the order of the Treasurer, U. S. Drawings and specifications will not be furnished to Contractors who have consistently failed to submit proposals. One set upon request, and when considered in the interests of the Government, will be furnished, in the discretion of the Assistant Director, to builders' exchanges, chambers of commerce or other organizations who will guarantee to make them available for any Sub-contractor or material firm interested, and to quantity surveyors, but this privilege will be withdrawn if the sets are not returned after they have accomplished their purpose. W. E. Reynolds, Assistant Director of Procurement, Public Buildings Branch.

EMPLOYMENT EXCHANGE

EMPLOYMENT SERVICE

SALARIED POSITIONS \$2,500 to \$25,000

This thoroughly organized advertising service of 27 years' recognized standing and reputation carries on preliminary negotiations for positions of the calibre indicated, through a procedure individualized to each client's personal requirements. Several weeks are required to negotiate and each individual must finance the moderate cost of his own campaign. Retaining fee protected by a refund provision as stipulated in our agreement. Identity is covered and, if employed, present position protected. If you have actually earned over \$2,500, send only name and address for details.

R. W. BIXBY, Inc.
274 Delward Bldg., Buffalo, N. Y.

HIGH GRADE MEN

Qualified candidates desiring salaried positions are invited to use our individual and confidential services in contacting responsible employers. We negotiate all preliminary overtures.

Established 1915
THE NATIONAL BUSINESS BOURSE
H. H. Harrison, Director
20 W. Jackson Blvd., Chicago

HELP WANTED

GENERAL MANAGER FOUNDRY AND MACHINE SHOP. A specialty foundry expanding its facilities and personnel, has an opening for an executive capable of assuming full charge of production, personnel and engineering. This man must have a successful record as an organizer, in handling labor relations, production control, costs, etc. The first letter must contain full details and salary requirement in order to receive consideration. Address Box S-258, care *The Iron Age*, 239 W. 39th St., New York.

WANTED: FIRST CLASS MECHANIC with engineering training, experienced in handling men and in planning and managing production, who is looking to advance himself, will find unusual opportunity with manufacturer of medium and large machine tools and special machinery. Give full particulars in first letter as to experience and with whom, also age and salary expected. Correspondence considered confidential. Address Box S-251, care *The Iron Age*, 239 W. 39th St., New York.

SALESMEN WANTED — Commission representatives to sell non-ferrous castings in Illinois, Indiana, Michigan, Wisconsin and Iowa territories. Company offering complete service on castings to five tons: aluminum, bronze, brass and copper. Patterns, machine shop, plating, painting. Give complete details in first letter. Address Box S-257, care *The Iron Age*, 239 W. 39th St., New York.

GENERAL MANAGER—STEEL FOUNDRY —NEW ENGLAND—Group advertising above will consider applications for a general manager who can produce unquestioned proof of steel casting business obtainable and ability to profitably operate steel foundry. Address Box S-262, care *The Iron Age*, 239 W. 39th St., New York.

MANUFACTURERS REPRESENTATIVES. An engineer, a practical man and an executive, all college men, contacting metal working industry of western Penna. desire additional item on commission basis. Address S-253, care *The Iron Age*, 239 W. 39th St., New York.

MANUFACTURERS OF MACHINERY, with modern equipment desire additional lines of machinery to manufacture; would like to contact responsible party with following; commission basis. Address Box S-229, care *The Iron Age*, 239 W. 39th St., New York.

HELP WANTED

WANTED ASSISTANT SUPERINTENDENT—Real opportunity and permanent position with long established, highest standing, machinery manufacturer for high grade production man 35-40 who can get best out of men and good at training new men. Must be graduate mechanical engineer, and good mechanic, with proven ability as leader and organizer in production work. Salary to start \$400.00 and bonus after three months. Must know thoroughly machine shop, sheet metal and plate shop operations and preferably with foundry experience. Must be capable in due time of taking full responsibility for efficient and economical production. Our own organization have been advised of this ad. Plant located in beautiful city of thirty thousand in Middle Atlantic States, employing 500 men and thoroughly modern in every way. No consideration whatever will be given to applicants whose qualifications are in any way short of the requirements as fully enumerated above. In your first letter, give age, education, places and period employed, duties, salary in each case, reason for changes and send photograph. All replies will be held in absolute confidence and no one communicated with until permission is granted. Address Box S-256, care *The Iron Age*, 239 W. 39th St., New York.

EXPERIENCED MECHANIC for reconditioning and setting up heading equipment, etc., also charge production of new Cap Screw and Stove Bolt Department. Excellent opportunity for right man. Plant located in Brooklyn. Write giving details of experience, etc., which will be held in confidence. Address Box S-250, care *The Iron Age*, 239 W. 39th St., New York.

STEEL CASTING SALESMANAGER, NEW ENGLAND. Group with ample capital ready to open fully equipped steel foundry in New England want sales manager. This man must now be handling good volume of steel casting business in this territory. Participation and profitable permanent arrangement for right man. Address Box S-261, care *The Iron Age*, 239 W. 39th St., New York.

SITUATIONS WANTED

PLANT ENGINEER—SUPERINTENDENT OF POWER AND MAINTENANCE—ELECTRICAL ENGINEER. Experienced in economical operation of Power Houses and the systematic maintenance of production machinery for high dependability and low labor cost. A thoroughly practical engineer whose experience in Foundry, Machine Manufacturing and Chemical Plants includes Design and Construction of Power Houses and Manufacturing Buildings, Electrical and Steam Distribution, Motor Applications, Material Handling, Pumping and Production Layouts. Seasoned ability with men. Technical and Commercial education. Twenty years' experience. Address Box M-20, care *The Iron Age*, 7310 Woodward Ave., Detroit Mich.

MAN WITH WIDE EXPERIENCE, sales management, purchasing and shop, hammered and drop forgings, castings and engineering products desires traveling or executive position. Address Box S-234, care *The Iron Age*, 239 W. 39th St., New York.

FIRST CLASS practical Boiler Shop foreman on Boilers, tanks and general plate work. Experienced in Laying out and Steel fabrication. Address Box S-235, care *The Iron Age*, 239 W. 39th St., New York.

MANUFACTURERS DIRECT REPRESENTATIVE. Fifteen years' contact Phila. dealers & industrials. Man 38. Address Box S-260, care *The Iron Age*, 239 W. 39th St., New York.

ROLL TURNER. Experienced on small shapes desires permanent position. Address Box S-254, care *The Iron Age*, 239 W. 39th St., New York.

SITUATIONS WANTED

PERSONAL MESSAGE to the PRESIDENT

I know a man who has the ability, experience and enthusiasm to do an A-1 job in sales and merchandising for some live company. He believes in himself and can show proof of his unusual record. Has had success in both personal and executive handling of sales, advertising and financing of both tangibles and intangibles. He is mechanically trained and inclined. Well educated. He has many valuable contacts and knows manufacturing problems. He is an inspiring speaker and organizer. He would lift a distinct burden for an over-busy president or prove an efficient vice-president with a co-ordinating job to do. Loyal beyond question. He does not lack sponsors. To valid inquiry I will gladly furnish details.

ADDRESS BOX S-252

Care *The Iron Age*, 239 W. 39th St., New York

ASSISTANT TO PRESIDENT AVAILABLE. Mr. President of a medium sized mechanical manufacturing organization, do you need an assistant that can help you in administrative, engineering, manufacturing, selling, sales promotion and personnel work? If so, the advertised's 17 years' experience is available to you. Education: a technical graduate. Experience: Electrical field—power production, motor and building supplies. Machine tool field—production parts, cutting tools, standard and high production special machinery. Location is secondary to opportunity. Address Box S-239, care *The Iron Age*, 239 W. 39th St., N. Y. City.

GENERAL MANAGER AVAILABLE. Are you contemplating a change in your executive personnel that will enable your business to maintain consistent sales and production costs and net profits under existing conditions, likewise fortify it against the next business decline? If so mutually desirable and satisfactory relations should result from contacting the advertised, whose broad experience as General Manager of metal manufacturing industries includes taking two companies out of the red and covers directing responsibility of all office, sales, financial and production activities. Address Box S-202, care *The Iron Age*, 239 W. 39th St., New York.

INDUSTRIAL ENGINEER: intensively experienced in all phases production manufacturing desires opportunity requiring wide knowledge of industrial economics. Applicant knows materials, costs analysis, planning, interdepartmental relations; experienced designing machine parts, tools, piece parts for economical production; thorough machinist and draftsman, knowledge of patent procedures, construction industry. Technical college education, age 38, Protestant. Address Box S-259, care *The Iron Age*, 239 W. 39th St., New York.

MANUFACTURER'S SALESMAN—competent, aggressive, experienced—in national distribution. Wide acquaintance handling large volume sales to utilities and jobbers. Gas and air conditioning equipment, plumbing and mill and mine specialties. 14 years as salesman, sales promotion man and sales manager, leading manufacturers. College man. Address Box A-923, care *The Iron Age*, Park Bldg., Pittsburgh, Pa.

OPEN HEARTH SUPERINTENDENT—AN EXPERIENCED STEEL MAKER ABLE TO GET GOOD PRODUCTION, QUALITY AND LOW COSTS SEEKS ENGAGEMENT. ADDRESS BOX S-246, CARE THE IRON AGE, 239 W. 39TH ST., NEW YORK.

MANUFACTURERS REPRESENTATIVE in Pittsburgh District contacting steel plants and manufacturing concerns. Selling experience together with engineering training and experience. Address Box A-924, care *The Iron Age*, 428 Park Bldg., Pittsburgh, Pa.

Help Wanted Rates

Set solid, minimum 50 words.....	\$5.00
Each additional word 10c	
All capitals, minimum 50 words.....	\$6.50
Each additional word 13c	
All capitals, leaded, minimum 50 words....	\$7.50
Each additional word 15c	

Do not send original letters of recommendation in replying to advertisements—duplicates will answer the purpose. Letters forwarded without charge.

Situation Wanted Rates

Set solid, minimum 25 words.....	\$1.00
Each additional word 4c	
All capitals, minimum 25 words.....	\$1.75
Each additional word 7c	
All capitals, leaded, minimum 25 words....	\$2.50
Each additional word 10c	

Display Advertising Rates Given on Request

COUNT SEVEN WORDS FOR
KEYED ADDRESS

ADVERTISERS INDEX

A Aaron Mchry. Co. 175, 177 Abbott Ball Co. The. 156 Abrasive Machine Tool Co. 80 Aetna-Standard Engineering Co. 4 The Alan Wood Steel Co. 93 Albert & Davidson Pipe Corp. 179 Albert Pipe Supply Co., Inc. 179 American Air Compressor Corp. 178 American Chemical Paint Co. 171 American Gas Association. 148 American Hollow Boring Co. 160 American Steel & Wire Co. 8-9, 12-13 American Telephone & Telegraph Co. 140 Apollo Steel Co. 1 Archer & Baldwin, Inc. 178 Armel, James P. 179 Armstrong-Blum Mfg. Co. 94 Armstrong Bros. Tool Co. 90 Athenia Steel Co., The. 154 Atlas Drop Forge Co. 160	Eastern Tool & Stpg. Co., Inc. 180 Electric Controller & Mfg. Co. 57 The Electric Hoist & Motor Co. 179 Electric Storage Battery Co., The. 144 Electro Metallurgical Co. 2 Elmes, Chas. F., Engineering Wks. 159 Employment Exchange Section. 181 Espan-Lucas Mach. Wks., The. 157 Essley, E. L., Mchry. Co., The. 177 Ex-Cell-O Corp. 61	Lucas Mch. Tool Co., The. 157 Lunney, Frank J. 177	Severin Machinery Co. 179 Shell Union Oil Co. 147 Shore Instrument & Mfg. Co., The. 170 Shuster, F. B., Co., The. 152 Simmons Mch. Tool Corp. 175 Simonds Mfg. Co., The. 165 Sleeper & Hartley, Inc. 167 Standard Oil Co. (Indiana). 184 Standard Pressed Steel Co. 151, 170 Standard Steam Winch & Hoist Co. 179 Stanhope, R. C., Inc. 178 Stanley Works, The. 159 Starrett, L. S., Co., The. 75 Stearns Magnetic Mfg. Co. 103 Steiner, George 179 Stevens Hotel 154 Strand, N. A., & Co. 157 Sullivan Machinery Co. 169 Sun Mchry. Co. 177, 178 Surface Combustion Corporation. 21
B Babcock & Wilcox Co., The. 130 Baird Machine Co., The. 20 Barnes, Wallace, Co., The, Division of Associated Spring Corp. 24 Barnett, I. A., Co., The. 180 Belmont Iron Works. 166 Belyea Co., Inc. 178 Bennett-Raffin Mchry. Corp. 177 Bethlehem Steel Co. 3 Bixby, R. W., Inc. 181 Blanchard Machine Co., The. 79 Bliss & Laughlin, Inc. 81 Botwinik Bros., Inc. 177 Brassert, H. A., & Co. 166 Brooke, E. & G., Iron Co. 171 Browning, Victor R., & Co. 179 Buffalo Mchry. Co., Inc. 174 Buffalo Wire Wks. Co., Inc. 173 Bullard Co., The. 52 Business Opportunities Section. 180	F Falls Clutch & Mchry. Co. 166 Farrel-Birmingham Co., Inc. 82 Flinn & Dreffeln Co. 131, 166 Ford, J. B., Co., The. 92 Ford Motor Co. (Johansson Division) 172 Fort Pitt Steel Corp. 178 Foster, Frank B. 177 Foster, L. B., Co., Inc. 179 Frank, M. K. 179 Franklin Mfg. Co., The. 180	M McKay Machine Co., The. 131 Malleable Iron Fittings Co. 161 Manhattan Rubber Mfg. Div. of Raybestos-Manhattan, Inc. The. 141 Marr-Galbreath Machinery Co. 174 Mathews Conveyor Co. 95 Maurath, Inc. 22 Merchants Steel Corp. 179 Midland Steel & Equip. Co. 179 Miles Mchry. Co. 174 Milne, A., & Co. 99 Monarch Machine Tool Co. 67 Monroe Calculating Machine Co., Inc. 134 Morey Mchry. Co., Inc. 174 Morgan Construction Co. 73 Morse Chain Co. 96 Morse Twist Drill & Machine Co. 133 Motor Repair & Mfg. Co., The. 178 Moyer, J. N. 177 Mundt, Chas., & Sons. 168 Munroe, R., & Sons Mfg. Corp. 166 Murchey Machine & Tool Co. 159 Murray Iron Wks. Co. 180 Myers, W. M. 180	T Tabor Mfg. Co. 157 Tennessee Coal, Iron & Railroad Co. 8-9 Texas Company, The. 14-15 Thomson-Gibb Elec. Welding Co. 167 Tomkins-Johnson Co., The. 100 Torrington Co., The. 166 Treasury Dept. 180 True Temper Inn. 154
C Cadman, A. W., Mfg. Co. 180 Canton Drop Forging & Mfg. Co. 161 Canton Fdry. & Mach. Co. 165 Carbon Malleable Casting Co., Inc. 164 Carnegie-Illinois Steel Corp. 8-9 Carpenter Steel Co. 18-19 Cattie, Joseph P., & Bros. 180 Cincinnati Bickford Tool Co., The. 66 Cincinnati Planer Co. 157 Clark Controller Co., The. 143 Clearing House Section. 174-179 Cleveland Cap Screw Co., The. 88 Cleveland Pneumatic Tool Co., The. 87 Cleveland Steel Tool Co., The. 158 Columbia Steel Co. 8-9, 12-13 Commonwealth Brass Corp. 167 Conco Engineering Works. 164 Cone Automatic Mach. Co., Inc. 156 Continental Machine Specialties, Inc. 155 Continental Steel Corp. 88 Contract Manufacturing Section. 180 Crane Co. 153 Crawford, F. H., & Co., Inc. 177 Crosby Co., The. 152 Crucible Steel Castings Co. 161 Cunningham, M. E., Co. 64	G Galland-Henning Mfg. Co. 102 Gallmeyer & Livingston Co. 89 Goldman, Harvey, & Co. 175 Goodman Electric Machinery Co. 178, 179 Goodrich, B. F., Co., The. 7 Goss & DeLeeuw Mch. Co. 156 Greenfield Tap & Die Corp. 138 Greenpoint Iron & Pipe Co., Inc. 179 Griffin Mfg. Co., Inc. 160 Gulf Oil Corp., Gulf Refining Co. 142	N National Acme Co., The. 136-137 National Automatic Tool Co. 76-77 National Bearing Metals Corp. 161 National Business Bourse, The. 181 National Machinery Exchange. 177 National Steel Corp. 16-17 National Tube Co. 8-9 Nicholson, W. H., & Co. 158 Nilson, A. H., Mch. Co. 167 Noble & Westbrook Mfg. Co., The. 170	U Union Carbide & Carbon Corp. 2 U. S. Steel Corp. Subsidiaries. 8-9, 12-13 U. S. Steel Products Co. 8-9, 12-13 U. S. Steel Wire Spring Co. 171
D Darwin & Milner, Inc. 159 Detroit Hoist & Machine Co. 165 Dings Magnetic Separator Co. 94 Dodge Steel Co. 69 Donahue Steel Prods. Co. 178 Dreis & Krump Mfg. Co. 158 Dunbar Bros. Co., Div. of Associated Spring Corp. 91 Durant Mfg. Co. 172	H Hammond Machinery Builders, Inc. 68 Hannifin Mfg. Co. 98 Harrington & King Perforating Co., The. 91 Hartford Drop Forge Co., The. 180 Hartman, Geo. N. 180 Hassall, John, Inc. 170 Hayward Co., The. 164 Heald Machine Co. 59 Heiz & Heiz, Inc. 170 Hendrick Mfg. Co. 168, 172 Hill-Clarke Mchry. Co. 174 Holcroft & Co. 154 Houde Engineering Corp. 98 Hunter Steel Co. 178 Hyde Park Fdry. & Mch. Co. 167 Hyman, Joseph, & Sons. 177 Hyman-Michaels Co. 179	O O'Brien Mchry. Co., The. 177 Ohio Locomotive Crane Co., The. 165 Oilgear Co., The. 78 Oliver Iron & Steel Corp. 100 Olson Mfg. Co. 180 Ottemiller, Wm. H., Co., Inc. 170	V V & O Press Co., The. 135 Vacuum Cup Metal Pulley Co., Inc. 102 Vanadium-Alloys Steel Co. 5 Victor Machinery Co. 177 Victor Machinery Exchange. 175 Vonnegut Moulder Corp. 89
E Earle Gear & Mach. Co. 165 Eastern Machine Screw Corp., The. 158	I Indianapolis Mchry. & Supply Co., Inc. 177 Industrial Machinery Corp. 175 Industrial Steel Casting Co., The. 164 Ingersoll-Rand Co. 139 Ingersoll Steel & Disc Co. 146 Inland Steel Co. 23 International Nickel Co., Inc. 183 Iron & Steel Prods., Inc. 178 & 179	P Packer Machine Co., The. 84 Pangborn Corporation. 86 Parish Pressed Steel Co. 97 Parker-Kalon Corp. 170 Peerless Machine Co. 60 Peoria Malleable Castings Co. 164 Pittsburgh Lecomelt Furnace Corp. 167 Pittsburgh Metallurgical Co., Inc. 125 Platt Bros. & Co., The. 173 Poor & Co., Canton Forge & Axle Works. 160 Progressive Mfg. Co., The. 154	W Walker, Walter 177 Walsh, J. T. 178 Wanted Section 179 Warner & Swasey Co. 70-71 Waterbury Farrel Foundry & Machine Co., The. 6 Wean Engineering Co., Inc., The. 131, 132 Weatherly Foundry & Mfg. Co. 180 Webb Wire Wks., The. 173 Weirton Steel Co. 16-17 Wells Mfg. Corp. 90 Western Wire Products Co. 172 Wetherell Bros. Co. 160 Whiting Corp. 163 Williams, J. H., & Co. 161 Wilson, Lee, Engineering Co. 131, 132 Worcester Stamped Metal Co. 164 Wylie-Stewart Mchry. Co. 179
	J Jarecki Mfg. Co. 169 Jones & Lamson Machine Co. 62-63	R R. & S. Machinery Co. 177 Raymond Mfg. Co., Div. of Associated Spring Corp. 171 Reeves Pulley Co. 83 Reliance Mchry. Sales Co. 177 Rhoades, R. W., Metaline Co., Inc. 156 Ridgway, Craig, & Son Co. 164 Ritterbush & Co., Inc. 175 Rivett Lathe & Grinder, Inc. 74 Robbins & Myers, Inc. 165 Rockford Drop Forge Co. 160 Rockdale Mill, Inc. 179 Roebbing's, John A., Sons Co. 10-11 Rogers Machine Works. 157 Rosenkranz, Weisbecker & Co., Inc. 175, 177 Rumsey Pump Corp. 167 Russell, Burdall & Ward Bolt & Nut Co. 149-150 Ruthman Machinery Co., The. 99 Ryerson, Jos. T., & Sons, Inc. 26	Z Zoll, Edwin H., Inc. 180
	K Kane & Roach, Inc. 127 Knox, Earl E., Co. 178	S Screw Machine Products Corp. 170 Seneca Wire & Mfg. Co., The. 172	CLASSIFIED SECTION Business Opportunities 180 Clearing House 174-179 Contract Manufacturing 180 Employment Exchange 181 Wanted 179 New Industrial Literature. 129

IT TAKES PLENTY OF
SHOCK RESISTANCE
TO SURVIVE A

20 TON KICK!



THE steel foundry, as well as the iron foundry, adds Nickel to many a composition. Adds it to fortify steel castings against the ravages of impacts, fatigue, stresses, and wear. That Nickel helps these castings live to a riper service age is proved by some of the case histories cited here. The two Pullmans shown are about to be joined with coupler knuckles (see inset) of Nickel Cast Steel. Just remember that when the impact comes there's a 20-ton bump between metals—and that there are heavy tensile and compressive stresses when the train starts and stops. Since 1928 most of these Pullman coupler knuckles have been made of Cast Nickel-chromium Steel. More than 10,000 have been placed in service. The possibilities of effecting long run economy in your equipment make the Cast Nickel Steels well-worth investigating.

NO service records are available for this particular collection of Nickel Cast Steel gears. But we have plenty of case histories of others of the same type and compositions that prove the ultimate economy of this material. An interesting photograph, this, from a number of standpoints, but especially interesting to makers and users of machinery because it shows how broad a range of gear applications may be supplied by strong, tough Nickel Steel castings. We invite consultation on the use of cast and wrought Nickel Steels, Nickel Cast Irons and other alloys containing Nickel in your equipment.



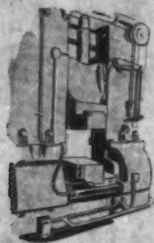
THESE curious globular castings came from the locks of the Panama Canal. They are called pintles—pivots on which the huge 79-ton lock gates turn. Before they were removed 20 years of service were chalked up to their credit. The one on the left (pressure side) shows only slight evidence of wear; the one on the right (slack side) shows dirt and scale but no wear. Another example of the downright economy of the Nickel Cast Steels.



NICKEL CAST STEELS

THE INTERNATIONAL NICKEL COMPANY, INC., NEW YORK, N. Y.

RIGHT DOWN
YOUR ALLEY



StanoStamp "C" Stops "Build-Up" on Dies

A Detroit Manufacturer* of automobile accessories and parts had a serious problem in stamping cold rolled steel. A Standard Salesman submitted a sample of StanoStamp "C" with instructions for mixing it with water and applying it to the work.

Here's what the customer writes—

"... The results were exactly what we desired.

The most serious trouble was experienced in the forming of "bumper guards" on our Toledo No. 97 Presses. Four hundred pieces were the largest quantity we produced without shutting down the press and cleaning the die with an emery stone. This cleanout was necessitated by a "build up" of the Stamping Compounds then used. Using StanoStamp "C" Compound, we have produced over thirty-three hundred pieces to date, without a shut down to clean a die, our production increasing about 30%. In addition to increasing our production and material saving in time, our Stampings are coming off the Presses entirely free from scratches and well formed.

The washability of StanoStamp "C" is remarkable: soluble in either hot or cold water, it is easily removed. Parts now are ready for chrome, brass or rubber plating.

We appreciate the assistance on this problem, and are pleased that your company had the foresight to develop a product so easy and simple to use."

Little more need be added except to remind you that a Standard Lubrication Engineer is ready to help you in any problem of metal-working lubrication.



Ask For
This
Booklet

"LUBRICATION IN GEAR CUTTING OPERATIONS"

It discusses the various methods of gear forming and the modern trend to high speed production. It outlines the basic requirements of cutting lubricants and describes where straight mineral oils, sulphurized mineral oil, soluble oils and paste compounds meet general gear cutting requirements. Ask for it or other booklets listed. Write Standard Oil Company (Indiana), 910 S. Michigan Avenue, Chicago, Illinois.

"Lubrication in Honing and Lapping"

"Lubrication in Grinding Operation"

*(Name will be supplied on request.)

*"I had that same LUBRICATION PROBLEM
just last week . . .*



*Here's how WE
SAVED THEM
MONEY!"*

WHILE these two lubrication engineers are "in conference", note how the others are listening in—but that's not eavesdropping here. The lubrication information that one engineer gets and the experiences he has are the common property of all engineers in his office—in fact, throughout the whole Standard Oil engineering organization. That's just one reason Standard Lubrication Engineering Service is so effective.

Problems in lubrication are being solved daily by these engineers. The wealth of information they have accumulated and the exchange of ideas between them has given each one a background of knowledge and experience in industrial lubrication that's hard

to beat. Try it the next time you have a particularly knotty problem of lubrication. Call your local Standard Oil office and tell one of the Lubrication Engineers you have a lubricating job he can't "lick". See what happens!

Remember this, you can't lose. Whether he's successful or not—it costs you nothing. The saving he does make is yours. From records of past service the odds are 100 to 1 he'll have many helpful, cost-saving suggestions to offer.

Copy., 1937, Standard Oil Co.

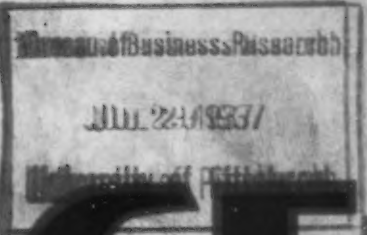
STANDARD OIL COMPANY (INDIANA)

LUBRICATION ENGINEERING

THE RIGHT
LUBRICANT
•
PROPERLY
APPLIED
•
TO REDUCE
COSTS

JULY 29, 1937

THE IRON AGE LAB



CULTURE-ENGINEERING LIBRARY
LIBRARY
WEST VIRGINIA UNIVERSITY

... YOU CAN
ALWAYS DEPEND
UPON THOMAS
COOPERATION

Thomas Strip

SPECIALIZED SERVICE
COLD ROLLED
STRIP STEEL

THE THOMAS STEEL CO.
WARREN, O.
SPECIALIZED PRODUCERS OF
COLD ROLLED STRIP STEEL

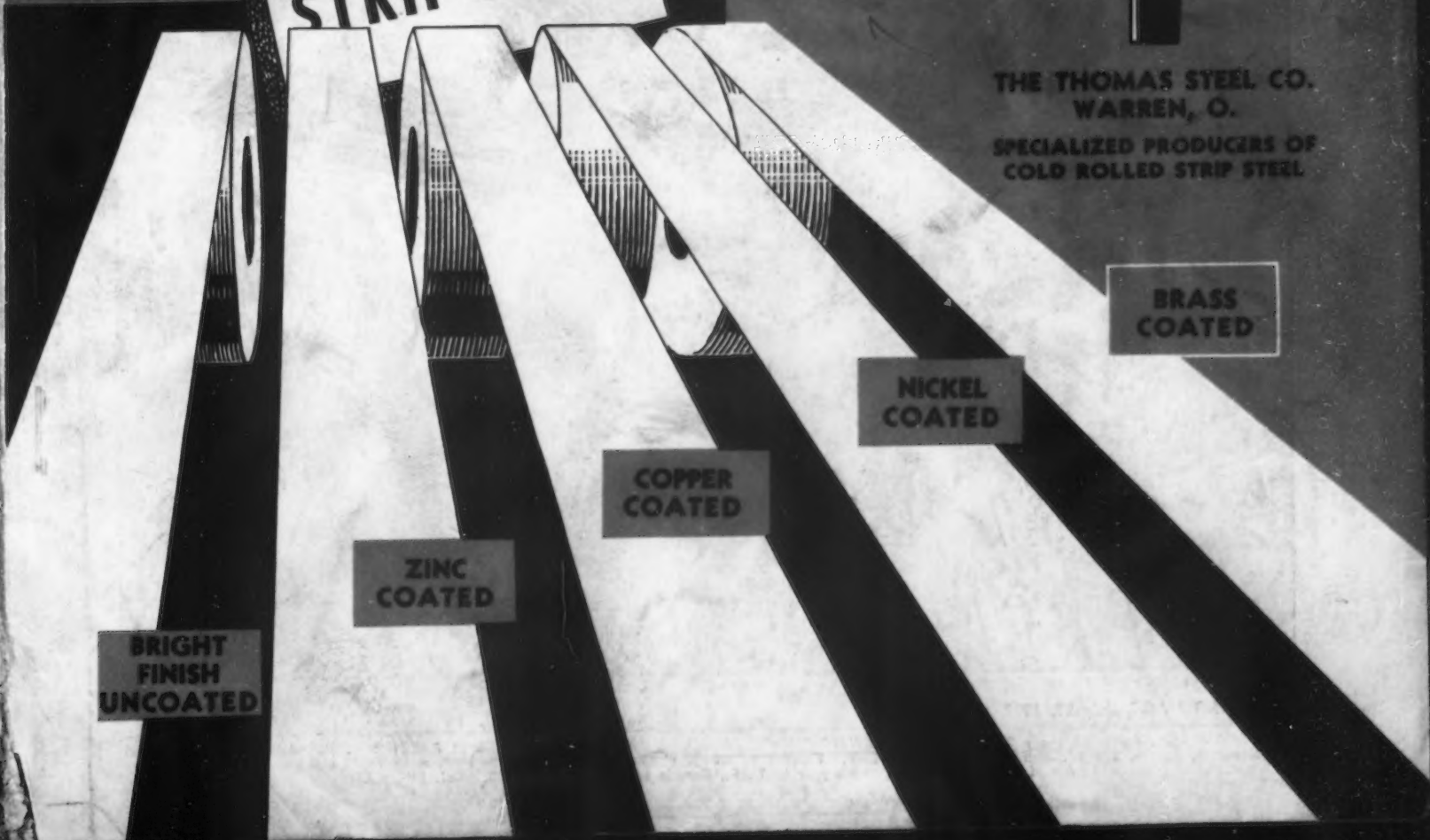
BRASS
COATED

NICKEL
COATED

COPPER
COATED

ZINC
COATED

BRIGHT
FINISH
UNCOATED



The OXWELD* CM-16

ENG. AC-ENG LIB.

I. 140

V. 140

NO. 5

J.L. 29, 1937

A 45-Pound Oxy-Acetylene Machine for Cutting Steel

The new OXWELD CM-16 portable cutting machine—priced at \$175.00† makes available to you many of the advantages of oxy-acetylene machine cutting, at a price never before so low.

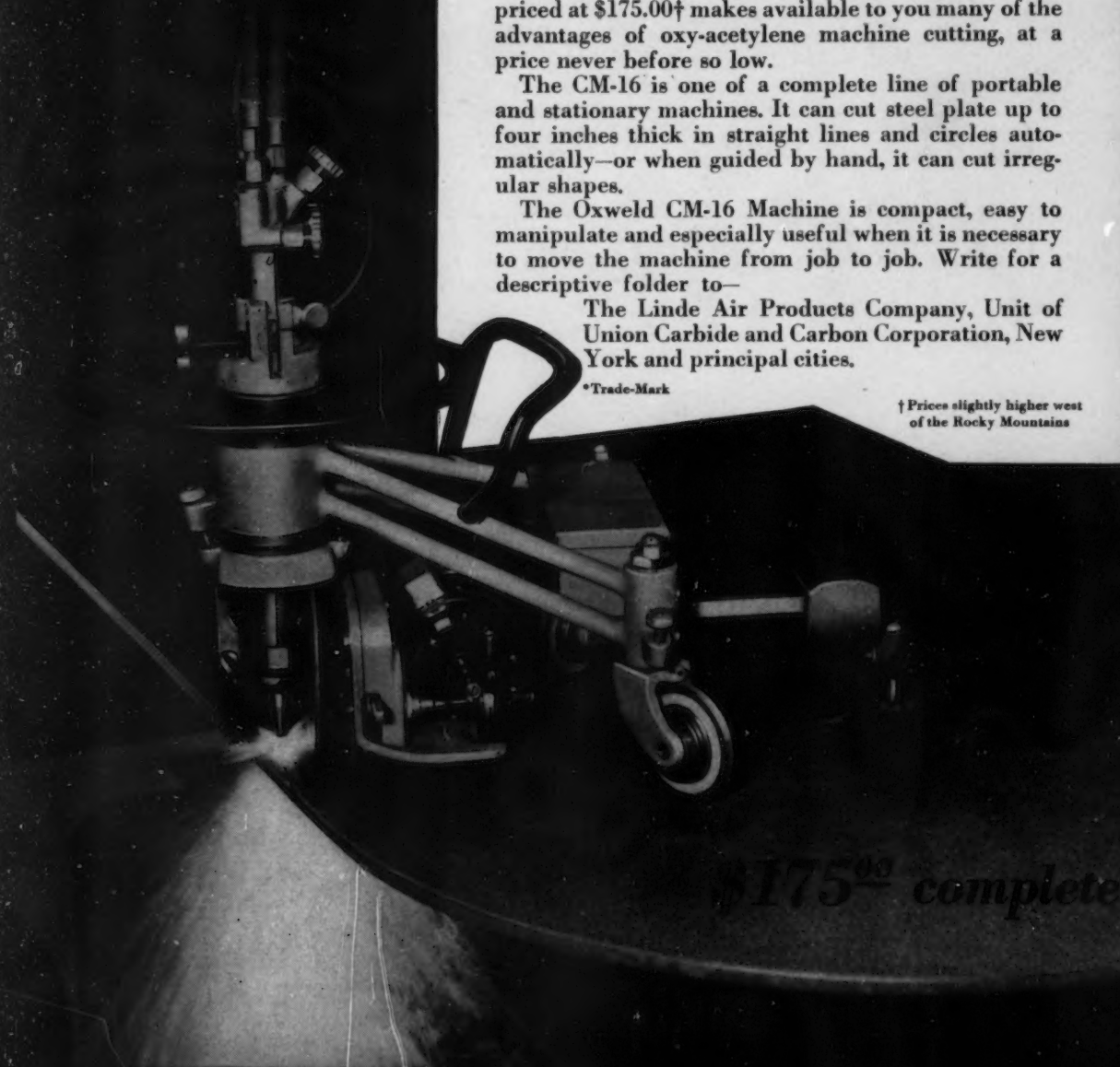
The CM-16 is one of a complete line of portable and stationary machines. It can cut steel plate up to four inches thick in straight lines and circles automatically—or when guided by hand, it can cut irregular shapes.

The OXWELD CM-16 Machine is compact, easy to manipulate and especially useful when it is necessary to move the machine from job to job. Write for a descriptive folder to—

The Linde Air Products Company, Unit of
Union Carbide and Carbon Corporation, New
York and principal cities.

*Trade-Mark

† Prices slightly higher west
of the Rocky Mountains



\$175⁰⁰ complete

Everything for Oxy-Acetylene Welding and Cutting

LINDE OXYGEN • PREST-O-LITE ACETYLENE • OXWELD APPARATUS AND SUPPLIES

FROM



LINDE

UNION CARBIDE



Quality IS NO ACCIDENT

Top quality—in horseflesh or high grade steels—is achieved only after years of careful selection and painstaking development. Such thoroughbred qualities as strength, endurance and dependable performance have been developed in Ludlum fine steels after endless experimentation and scientific study.

The forward march of industry has set up unprecedented standards of precision,

wearing qualities and resistance to destructive forces. Ludlum has helped make these standards possible with new alloys that fill many general needs or solve individual problems *exactly*.

If you are looking for better performance in steel, or a special steel for any purpose, write to Research Department, Ludlum Steel Company, 729 A Street, Watervliet, New York.

LUDLUM

FINE STEELS SINCE 1854

TOOL • STAINLESS • CARBON • ALLOY

PRICES ON FINISHED AND SEMI-FINISHED IRON AND STEEL

SEMI-FINISHED STEEL

Billets, Blooms and Slabs

F.o.b. Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham. Prices at Duluth are \$2 a ton higher, and delivered Detroit \$3 higher.

Per Gross Ton	
Rerolling	\$37.00
Forging quality	43.00

Sheet Bars

F.o.b. Pittsburgh, Chicago, Cleveland, Youngstown, Buffalo, Canton, Sparrows Point, Md.

Per Gross Ton	
Open-hearth or Bessemer	\$37.00

Skelp

F.o.b. Pittsburgh, Chicago, Youngstown, Buffalo, Coatesville, Pa., Sparrows Point, Md.

Per Lb.	
Grooved, universal and sheared	2.10c.

Wire Rods

(No. 5 to 9/32 in.)

Per Gross Ton	
F.o.b. Pittsburgh or Cleveland	\$47.00
F.o.b. Chicago, Youngstown or Anderson, Ind.	48.00
F.o.b. Worcester, Mass.	49.00
F.o.b. Birmingham	50.00
F.o.b. San Francisco	56.00
F.o.b. Galveston	53.00
Rods over 9/32 in. to 47/64 in., inclusive, \$5 a ton over base.	

BARS, PLATES, SHAPES

Iron and Steel Bars

Soft Steel

Base per Lb.	
F.o.b. Pittsburgh	2.45c.
F.o.b. Chicago or Gary	2.50c.
F.o.b. Duluth	2.60c.
Del'd Detroit	2.60c.
F.o.b. Cleveland	2.50c.
F.o.b. Buffalo	2.55c.
Del'd Philadelphia	2.74c.
Del'd New York	2.78c.
F.o.b. Birmingham	2.60c.
F.o.b. cars dock Gulf ports	2.85c.
F.o.b. cars Pacific Ports	3.00c.

Rail Steel

(For merchant trade)

F.o.b. Pittsburgh	2.30c.
F.o.b. Cleveland, Chicago, Gary or Moline, Ill.	2.35c.
F.o.b. Buffalo	2.40c.
F.o.b. Birmingham	2.45c.
F.o.b. cars dock Gulf ports	2.70c.
F.o.b. cars dock Pacific ports	2.85c.

Billet Steel Reinforcing

(Straight lengths as quoted by distributors)

F.o.b. Pittsburgh	2.55c.
F.o.b. Buffalo, Cleveland, Youngstown, Chicago, Gary or Birmingham	2.60c.
Del'd Detroit	2.70c.
F.o.b. cars dock Gulf ports	2.95c.
F.o.b. cars dock Pacific ports	2.95c.

Rail Steel Reinforcing

(Straight lengths as quoted by distributors)

F.o.b. Pittsburgh	2.40c.
F.o.b. Buffalo, Cleveland, Youngstown, Chicago, Gary or Birmingham	2.45c.
F.o.b. cars dock Gulf ports	2.80c.
F.o.b. cars dock Pacific ports	2.80c.

Iron

F.o.b. Chicago	2.40c.
F.o.b. Pittsburgh (refined)	3.60c.

Cold Finished Bars and Shafting*

Base per Lb.	
F.o.b. Pittsburgh	2.90c.
F.o.b. Cleveland, Chicago and Gary	2.95c.
F.o.b. Buffalo	3.00c.
F.o.b. Detroit	2.95c.

* In quantities of 10,000 to 19,999 lb.

Plates

Base per Lb.	
F.o.b. Pittsburgh	2.25c.
F.o.b. Chicago or Gary	2.30c.
Del'd Cleveland	2.435c.
F.o.b. Coatesville or Spar. Pt.	2.35c.
Del'd Philadelphia	2.435c.
Del'd New York	2.53c.
F.o.b. Birmingham	2.40c.

F.o.b. cars dock Gulf ports	2.65c.
F.o.b. cars dock Pacific ports	2.80c.
Wrought iron plates, f.o.b. Pittsburgh	3.80c.

Floor Plates

F.o.b. Pittsburgh	3.80c.
F.o.b. Chicago	3.85c.
F.o.b. Coatesville	3.90c.
F.o.b. cars dock Gulf ports	4.20c.
F.o.b. cars dock Pacific ports	4.35c.

Structural Shapes

Base per Lb.	
F.o.b. Pittsburgh	2.25c.
F.o.b. Chicago	2.30c.
Del'd Cleveland	2.435c.
F.o.b. Buffalo or Bethlehem	2.35c.
Del'd Philadelphia	2.455c.
Del'd New York	2.5025c.
F.o.b. Birmingham (standard)	2.40c.
F.o.b. cars dock Gulf ports	2.65c.
F.o.b. cars dock Pacific ports	2.80c.

Steel Sheet Piling

Base per Lb.	
F.o.b. Pittsburgh	2.60c.
F.o.b. Chicago or Buffalo	2.70c.
F.o.b. cars dock Gulf or Pacific Coast ports	3.05c.

RAILS AND TRACK SUPPLIES

F.o.b. Mill

Standard rails, heavier than 60 lb., per gross ton	\$42.50
Angle bars, per 100 lb.	2.80

F.o.b. Basing Points

Light rails (from billets) per gross ton	\$43.00
Light rails (from rail steel) per gross ton	42.00

Base per Lb.

Spikes	3.15c.
Tie plates, steel	2.30c.
Tie plates, Pacific Coast ports	2.40c.
Track bolts, to steam railroads	4.35c.
Track bolts, to jobbers, all sizes (per 100 counts)	

65-5 per cent off list
Basing points on light rails are Pittsburgh, Chicago and Birmingham; on spikes and tie plates, Pittsburgh, Chicago, Portsmouth, Ohio, Weirton, W. Va., St. Louis, Kansas City, Minnequa, Colo., Birmingham and Pacific Coast ports; on tie plates alone, Steelton, Pa.; Buffalo; on spikes alone, Youngstown, Lebanon, Pa., Richmond, Va.

SHEETS, STRIP, TIN PLATE

TERNE PLATE

Sheets

Hot Rolled

Base per Lb.	
No. 10, f.o.b. Pittsburgh	2.40c.
No. 10, f.o.b. Gary	2.50c.
No. 10, del'd Detroit	2.60c.
No. 10, del'd Philadelphia	2.69c.
No. 10, f.o.b. Granite City	2.60c.
No. 10, f.o.b. Birmingham	2.55c.
No. 10, f.o.b. cars dock Pacific ports	2.95c.
No. 10 wrought iron, Pgh.	4.25c.

Hot-Rolled Annealed

No. 24, f.o.b. Pittsburgh	3.15c.
No. 24, f.o.b. Gary	3.25c.
No. 24, del'd Detroit	3.35c.
No. 24, del'd Philadelphia	3.44c.
No. 24, f.o.b. Granite City	3.35c.
No. 24, f.o.b. Birmingham	3.30c.
No. 24, f.o.b. cars dock Pacific ports	3.80c.
No. 24, wrought iron, Pitts-	
burgh	5.15c.

Heavy Cold-Rolled

No. 10 gage, f.o.b. Pittsburgh	3.10c.
No. 10 gage, f.o.b. Gary	3.20c.
No. 10 gage, f.o.b. Detroit	3.30c.
No. 10 gage, del'd Philadelphia	3.39c.
No. 10, f.o.b. Granite City	3.30c.
No. 10 gage, f.o.b. Birmingham	3.25c.
No. 10 gage, f.o.b. cars dock Pacific ports	3.70c.

Light Cold-Rolled

No. 20 gage, f.o.b. Pittsburgh	3.55c.
No. 20 gage, f.o.b. Gary	3.65c.
No. 20 gage, del'd Detroit	3.75c.
No. 20 gage, del'd Philadelphia	3.84c.
No. 20, f.o.b. Granite City	3.75c.
No. 20 gage, f.o.b. Birmingham	3.70c.
No. 20 gage, f.o.b. cars, dock, Pacific ports	4.10c.

Galvanized Sheets

No. 24 gage, f.o.b. Pittsburgh	3.80c.
No. 24, f.o.b. Gary	3.90c.
No. 24, del'd Philadelphia	4.09c.
No. 24, f.o.b. Granite City	4.00c.

No. 24, f.o.b. Birmingham	3.95c.
No. 24, f.o.b. cars, dock, Pacific ports	4.40c.
No. 24, wrought iron, Pittsburgh	6.10c.

Electrical Sheets

(F.o.b. Pittsburgh)

Base per Lb.	
Field grade	3.35c.
Armature	3.70c.
Electrical	4.20c.
Special Motor	5.10c.
Special Dynamo	5.80c.
Transformer	6.30c.
Transformer Special	7.30c.
Transformer Extra Special	7.80c.

Base gage changed from 28 to 24 gage. Gage extras are the same as those applying on hot-rolled, annealed sheets with few exceptions.
Silicon Strip in coils—Sheet price plus silicon sheet extra width extras plus 25c. per 100 lb. for coils.

Long Ternes

No. 24, unassorted 8-lb. coating f.o.b. Pittsburgh	4.10c.
F.o.b. Gary	4.20c.
F.o.b. cars, dock, Pacific ports	4.80c.

Vitreous Enameling Stock

No. 20, f.o.b. Pittsburgh	3.50c.
No. 20, f.o.b. Gary	3.60c.
No. 20, f.o.b. Granite City	3.70c.
No. 20, f.o.b. cars dock Pacific ports	4.10c.

Tin Mill Black Plate

No. 28, f.o.b. Pittsburgh, per lb.	3.30c.
No. 28, Gary	3.40c.
No. 28, f.o.b. Granite City	3.50c.
No. 28, cars dock Pacific ports, boxed	4.175c.

Tin Plate

Base per Box	
Standard cokes, f.o.b. Pittsburgh district mill	\$5.35
Standard cokes, f.o.b. Gary	5.45
Standard coke, f.o.b. Granite City	5.55

Above quotations practically the equivalent of previous quotations owing to new method of quoting, effective Jan. 1, 1937.

Special Coated Manufacturing Ternes

Base per Box	
F.o.b. Pittsburgh	\$4.65
F.o.b. Gary	4.75
F.o.b. Granite City	4.85

* Customary 7½ per cent discount in effect through 1936 discontinued as of Jan. 1, 1937.

Terne Plate

(F.o.b. Pittsburgh)

(Per Package, 112 sheets, 20 x 28 in.)	
8-lb. coating I.C.	\$11.00
15-lb. coating I.C.	13.00
20-lb. coating I.C.	14.00
25-lb. coating I.C.	15.00
30-lb. coating I.C.	16.25
40-lb. coating I.C.	18.50

Hot-Rolled Hoops, Bands, Strip and

Flats under ¼ in.

Base per Lb.	
All widths up to 24 in., Pittsburgh	2.40c.
All widths up to 24 in., Chicago	2.50c.
All widths up to 24 in., del'd Detroit	2.60c.
All widths up to 24 in., Granite City	2.60c.
All widths up to 24 in., Birmingham	2.55c.
Cooperage stock, Pittsburgh	2.50c.
Cooperage stock, Chicago	2.60c.

Cold-Rolled Strip*

Base per Lb.	
F.o.b. Pittsburgh	3.20c.
F.o.b. Cleveland	3.20c.
Del'd Chicago	3.48c.
F.o.b. Worcester	3.40c.

* Carbon 0.25 and less.

Cold Rolled Spring Steel

Pittsburgh and Cleveland Worcester	
Carbon 0.25-0.50%	3.20c. 3.40c.
Carbon .51-.75	4.45c. 4.65c.
Carbon .76-1.00	6.30c. 6.50c.
Carbon Over 1.00	8.50c. 8.70c.

Fender Stock

No. 14, Pittsb'gh or Cleveland	3.45c.
No. 20, Pittsb'gh or Cleveland	3.85c.

WIRE PRODUCTS

(Carload lots, f.o.b. Pittsburgh and Cleveland)
To Manufacturing Trade

Per Lb.
Bright wire2.90c.
Spring wire3.50c.
Chicago prices on products sold to the manufacturing trade are \$1 a ton above Pittsburgh or Cleveland. Worcester and Duluth prices are \$2 a ton above, Birmingham \$3 above, and Pacific Coast prices \$9 a ton above Pittsburgh or Cleveland.

To the Trade
Base per Keg
Standard wire nails\$2.75
Smooth coated nails\$2.75
Cut nails, carloads\$3.60

Base per 100 Lb.
Annealed fence wire\$3.20
Galvanized fence wire3.60
Polished staples3.45
Galvanized staples3.70
Barbed wire, galvanized3.40
Twisted barbed wire3.40
Woven wire fence, base column. 74
Single loop bale ties, base col. 63

Chicago and Anderson, Ind., mill prices are \$1 a ton over Pittsburgh base (on all products except woven wire fence, for which the Chicago price is \$2 above Pittsburgh); Duluth, Minn., mill prices are \$2 a ton over Pittsburgh, except for woven wire fence, which is \$3 over Pittsburgh and Birmingham mill prices are \$3 a ton over Pittsburgh.

On wire nails, barbed wire and staples, prices at Houston, Galveston and Corpus Christi, Tex., New Orleans, Lake Charles, La., and Mobile, Ala., are \$6 a ton over Pittsburgh.

On nails, staples and barbed wire, prices of \$6 a ton above Pittsburgh are also quoted at Beaumont and Orange, Tex.

STEEL AND WROUGHT IRON PIPE AND TUBING

Welded Pipe
Base Discounts, f.o.b. Pittsburgh
District and Lorain, Ohio, Mills
F.o.b. Pittsburgh only on wrought iron pipe.

Butt Weld
In. Steel Black Galv. In. Wrought Iron Black Galv.
1/852 31 1/8 & 1/413 +35
1/4 to 3/855 38 1/420 1 1/2
1/259 49 3/426 8
3/462 53 1 & 1 1/430 14
1 to 364 55 1 1/234 16 1/2
233 16

Lap Weld
257 47 1/226 10
2 1/2 & 360 50 1/227 12 1/2
3 1/2 to 662 52 1/229 16
7 & 861 50 1/228 15
9 & 1060 50 9 to 1224 10
11 & 1259 49

Butt Weld, extra strong, plain ends
1/850 36 1/4 & 1/414 +48
1/4 to 3/852 40 1/221 4
1/257 48 3/427 10
3/461 52 1/2 1 to 234 17 1/2
1 to 363 55

Lap Weld, extra strong, plain ends
255 46 1/2 229 13 1/2
2 1/2 & 359 50 1/2 2 1/2 to 435 20 1/2
3 1/2 to 662 54 4 1/2 to 633 19
7 & 861 51 7 & 834 19 1/2
9 & 1060 50 9 to 1228 15 1/2
11 & 1259 49

On butt-weld and lap-weld steel pipe jobbers are granted a discount of 5%. On less-than-carload shipments prices are determined by adding 25 and 30% and the carload freight rate to the base card.

Note—Chicago district mills have a base two points less than the above discounts. Chicago delivered base is 2 1/2 points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point producing the lowest price to destination.

Boiler Tubes
Seamless Steel Commercial Boiler Tubes and Locomotive Tubes
(Net base prices per 100 ft. f.o.b. Pittsburgh in carload lots)

	Cold Drawn	Hot Rolled
1 in. o.d.	13 B.W.G. \$ 9.46	\$ 8.41
1 1/4 in. o.d.	13 B.W.G. 11.21	9.96
1 1/2 in. o.d.	13 B.W.G. 12.38	11.00
1 3/4 in. o.d.	13 B.W.G. 14.09	12.51
2 in. o.d.	13 B.W.G. 15.78	14.02
2 1/4 in. o.d.	13 B.W.G. 17.60	15.63
2 1/2 in. o.d.	12 B.W.G. 19.37	17.21
2 3/4 in. o.d.	12 B.W.G. 21.22	18.85
3 in. o.d.	12 B.W.G. 22.49	19.98
3 1/4 in. o.d.	12 B.W.G. 23.60	20.97
3 1/2 in. o.d.	10 B.W.G. 35.19	40.15
3 3/4 in. o.d.	11 B.W.G. 29.79	26.47
4 in. o.d.	10 B.W.G. 36.96	32.83
5 in. o.d.	9 B.W.G. 56.71	50.38
6 in. o.d.	7 B.W.G. 87.07	77.35

Extra for less-carload quantities:
25,000 lb. or ft. to 39,999 lb. or ft. 5 %
12,000 lb. or ft. to 24,999 lb. or ft. 12 1/2 %
8,000 lb. or ft. to 11,999 lb. or ft. 25 %
2,000 lb. or ft. to 5,999 lb. or ft. 35 %
Under 2,000 lb. or ft. 50 %

CAST IRON WATER PIPE

Per Net Ton
*6-in. and larger, del'd Chicago, \$55.00
6-in. and larger, del'd New York 53.00
6-in. and larger, Birmingham. 47.00
6-in. and larger, f.o.b. dock, San Francisco or Los Angeles.... 56.00
F.o.b. dock, Seattle..... 56.00
4-in., f.o.b. dock, San Francisco or Los Angeles 59.00
F.o.b. dock, Seattle 59.00

Class "A" and gas pipe, \$3 extra.
4-in. pipe is \$3 a ton above 6-in.

Prices for lots of less than 200 tons. For 200 tons and over, 6-in. and larger is \$46, Birmingham, and \$54 delivered Chicago; and 4-in. pipe, \$49, Birmingham, and \$58 delivered Chicago.

BOLTS, NUTS, RIVETS, SET SCREWS

Bolts and Nuts
(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

Per Cent Off List
Machine and carriage bolts:
1/2 in. x 6 in. and smaller.65 and 5*
Larger and longer up to
1 in.60 and 10*
1 1/2 in. and larger.....60 and 5*
Lag bolts60 and 10*
Plow bolts, Nos. 1, 2, 3
and 765 and 5
Hot pressed nuts, and c.p.c.
and t nuts, square or hex.
blank or tapped:
1/2 in. and smaller..... 65
9/16 in. to 1 in. inclusive...60 and 5
1 1/2 in. and larger 60

Jobbers discount on above items, 5 per cent.

* Less carload lots and less than full container quantity. Less carload lots in full container quantity, an additional 10 per cent discount; carload lots and full container quantity, still another 5 per cent discount.

Semi-finished hexagon nuts, U.S.S. and S.A.E.:

1/2 in. and smaller60 and 10
9/16 in. to 1 in. inclusive...60 and 5
1 1/2 in. and larger 60
Stove bolts in packages, nuts attached72 1/2
Stove bolts in packages, with nuts separate72 1/2 and 5
Stove bolts in bulk..... 80

On stove bolts freight is allowed to destination on 200 lb. and over.

Large Rivets
(1/2-in. and larger)
Base per 100 Lbs.

F.o.b. Pittsburgh or Cleveland..\$3.60
F.o.b. Chicago or Birmingham.. 3.70

Small Rivets
(7/16-in. and smaller)
Per Cent Off List

F.o.b. Pittsburgh65 and 5
F.o.b. Cleveland65 and 5
F.o.b. Chicago and Birmingham65 and 5

Cap and Set Screws
(Freight allowed up to but not exceeding 65c. per 100 lb. on lots of 200 lb. or more)

Per Cent Off List
Milled cap screws, 1 in. dia. and smaller50 and 10
Milled standard set screws, case hardened, 1 in. dia. and smaller 75
Milled headless set screws, cut thread 1/2 in. and smaller..... 75
Upset hex. head cap screws U.S.S. or S.A.E. thread, 1 in. and smaller 60
Upset set screws, cup and oval points 75
Milled studs 65

Alloy and Stainless Steel

Alloy Steel Blooms, Billets and Slabs
F.o.b. Pittsburgh, Chicago, Canton, Massillon, Buffalo, Bethlehem.
Base price, \$60 a gross ton.

Alloy Steel Bars
F.o.b. Pittsburgh, Chicago, Buffalo, Bethlehem, Massillon or Canton.
Open-hearth grade, base3.00c.
Delivered, Detroit3.15c.

S.A.E. Alloy Differential Series
Numbers per 100 lb.
200 (1/2% Nickel)\$0.35
2100 (1 1/4% Nickel) 0.75
2300 (3 1/2% Nickel) 1.55

2500 (5% Nickel)	\$2.25
3100 Nickel-chromium	0.70
3200 Nickel-chromium	1.35
3300 Nickel-chromium	3.80
3400 Nickel-chromium	3.20
4100 Chromium-molybdenum (0.15 to 0.25 Molybdenum)	0.55
4100 Chromium-molybdenum (0.25 to 0.40 Molybdenum)	0.75
4600 Nickel-molybdenum (0.20 to 0.30 Mo, 1.50 to 2.00 Ni)	1.10
5100 Chrome steel (0.60-0.90 Cr.)	0.35
5100 Chrome steel (0.80-1.10 Cr.)	0.45
5100 Chromium spring steel.....	0.15
6100 Chromium-vanadium bar.....	1.20
6100 Chromium-vanadium spring steel	0.85
Chromium-nickel-vanadium	1.50
Carbon-vanadium	0.85

These prices are for hot-rolled steel bars. The differential for most grades in electric furnace steel is 50c. higher. Slabs with a section area of 16 in. and 2 1/2 in. thick or over take the billet base.

Alloy Cold-Finished Bars
F.o.b. Pittsburgh, Chicago, Gary, Cleveland or Buffalo, 3.60c. base per lb. Delivered Detroit, 3.75c., carlots.

CORROSION & HEAT RESISTANT ALLOYS

(Base prices, cents per lb., f.o.b. Pittsburgh)

Chrome-Nickel		No. 304	No. 302
Forging billets	No. 304	21.25c.	20.40c.
Bars	25c.		24c.
Plates	29c.		27c.
Structural shapes	25c.		24c.
Sheets	36c.		34c.
Hot-rolled strip ..	23.50c.		21.50c.
Cold-rolled strip ..	30c.		28c.
Drawn wire	25c.		24c.

Straight Chrome		No. 410	No. 430	No. 442	No. 446
Bars ..	18.50c.	19c.	22.50c.	27.50c.	27.50c.
Plates ..	21.50c.	22c.	25.50c.	30.50c.	30.50c.
Sheets ..	26.50c.	29c.	32.50c.	36.50c.	36.50c.
Hot strip ..	17c.	17.50c.	23c.	28c.	28c.
Cold stp. ..	22c.	22.50c.	28.50c.	36.50c.	36.50c.

TOOL STEEL

High speed	67c.
High-carbon-chrome	43c.
Oil-hardening	24c.
Special	22c.
Extra	18c.
Regular	14c.

Prices for warehouse distribution to all points on or East of Mississippi River are 2c. a lb. higher. West of Mississippi quotations are 3c a lb. higher.

British and Continental BRITISH

Per Gross Ton
f.o.b. United Kingdom Ports
Ferromanganese, ex-port£20 Nominal
Tin plate, per base box 25s. to 25s. 6d.
Steel bars, open-hearth.....£11
Beams, open-hearth.....£10 12s. 6d.
Channels, open-hearth.....£10 12s. 6d.
Angles, open-hearth.....£10 12s. 6d.
Black sheets, No. 24 gage£15
Galvanized sheets, No. 24 gage£18 15s.

CONTINENTAL

Per Metric Ton, Gold £, f.o.b. Continental Ports
Current dollar equivalent is ascertained by multiplying gold pound prices by 124.14 to obtain franc equivalent and then converting at present rate of dollar-france exchange.
Billets, Thomas£4 7s. 6d.
Wire rods, No. 5 B.W.G.£5 2s. 6d.
Steel bars, merchant£5
Sheet bars£4 8s. 6d.
Plate 1/4 in. and up.....£6 7s.
Plate 3/16 in. and 5 mm.....£6 13s.
Sheet, 1/4 in.£7 9s. 6d.
Beams, Thomas£4 18s.
Angles (Basic)£4 18s.
Hoops and strip, base£6

IRON AND STEEL WAREHOUSE PRICES

PITTSBURGH*

	Per Net Ton
Plates	3.70c.
Structural shapes	3.70c.
Soft steel bars and small shapes	3.80c.
Reinforcing steel bars	3.80c.
Cold-finished and screw stock:	
Rounds and hexagons	4.15c.
Squares and flats	4.15c.
Hot rolled strip incl. 3/16 in. thick, under 24 in. wide	4.00c.
Hoops	4.50c.
Hot-rolled annealed sheets (No. 24), 10 or more bundles	4.50c.
Galv. sheets (No. 24), 10 or more bundles	5.15c.
Hot-rolled sheets (No. 10)	3.75c.
Galv. corrug. sheets (No. 28), per square (more than 3750 lb.)	\$4.48
Spikes, large	1 to 24 kegs 3.90c.
	Per Cent Off List
Track bolts, all sizes, per 100 count	55
Machine bolts, 100 count	**
Carriage bolts, 100 count	**
Nuts, all styles, 100 count	**
Large rivets, base per 100 lb.	\$4.35
Wire, black, soft ann'l'd, base per 100 lb.	3.45c.
Wire, galv. soft, base per 100 lb.	3.85c.
Common wire nails, per keg	3.00c.
Cement coated nails, per keg	3.00c.

On plates, structurals, bars, reinforcing bars, bands, hoops and blue annealed sheets, base applies to orders of 400 to 9999 lb.

*Delivered in Pittsburgh switching district.

**Prices on application.

CHICAGO Base per Lb.

Plates and structural shapes	3.75c.
Soft steel bars, rounds	3.85c.
Soft steel bars, squares and hexagons	4.00c.
Cold-fin. steel bars:	
Rounds and hexagons	4.30c.
Flats and squares	4.30c.
Hot-rolled strip	4.10c.
Hot-rolled annealed sheets (No. 24)	4.60c.
Galv. sheets (No. 24)	5.25c.
Spikes (keg lots)	4.40c.
Track bolts (keg lots)	5.60c.
Rivets, structural (keg lots)	4.60c.
Rivets, boiler (keg lots)	4.70c.
	Per Cent Off List
Machine bolts	*60
Carriage bolts	*60
Lag screws	*55 and 5
Hot-pressed nuts, sq. tap or blank	*60
Hot-pressed nuts, hex. tap or blank	*60
Hex. head cap screws	60
Cut point set screws	75
Flat head bright wood screws	62 and 20
Spring cotters	45
Stove bolts in full packages	72½
Rd. hd. tank rivets, 7/16 in. and smaller	55
Wrought washers	\$4.00 off list
Black ann'l'd wire per 100 lb. to mfg. trade (No. 14 and heavier)	\$4.55
Com. wire nails, 15 kegs or more, per keg	\$3.20
Cement c't'd nails, 15 kegs or more, per keg	\$3.20

On plates, shapes, bars, hot-rolled strip and heavy hot-rolled sheets, the base applies on orders of 400 to 3999 lb. All prices are f.o.b. consumers' plants within the Chicago switching district.

*These are quotations delivered to city trade for quantities of 100 lb. or more. For lots of less than 100 lb., the quotation is 60 per cent off. Discounts applying to country trade are 70 per cent off, f.o.b. Chicago, with full or partial freight allowed up to 50c. per 100 lb.

NEW YORK

	Base per Lb.
Plates, ¼ in. and heavier	4.00c.
Structural shapes	3.97c.
Soft steel bars, round	4.12c.
Iron bars, Swed. charcoal	7.00 to 7.25c.
Cold-fin. shafting and screw stock:	
Rounds and hexagons	4.57c.
Flats and squares	4.57c.
Cold-rolled; strip, soft and quarter hard	3.92c.
Hoops	4.32c.

Bands	4.32c.
Hot-rolled sheets (No. 10)	4.00 to 4.07c.
Hot-rolled ann'l'd sheets (No. 24*)	4.50 to 4.82c.
Galvanized sheets (No. 24*)	5.47c.
Long terme sheets (No. 24)	5.50 to 6.20c.
Armco iron, galv. (No. 24†)	6.25c.
Toncan iron, galv. (No. 24†)	6.25c.
Galvanneal (No. 24†)	6.60c.
Armco iron, hot-rolled annealed (No. 24†)	5.65c.
Toncan iron, hot-rolled annealed (No. 24†)	5.65c.
Armco iron hot-rolled (No. 10†)	4.60c.
Toncan iron, hot-rolled (No. 10†)	4.60c.
Cold-rolled sheets (No. 20) for quantities 400 to 1499 lb.	
Standard quality	5.40c.
Deep drawing	6.05c.
Stretch leveled	6.05c.
SAE, 2300, hot-rolled	7.82c.
SAE, 3100, hot-rolled	6.37c.
SAE, 6100, hot-rolled, annealed	10.52c.
SAE, 2300, cold-rolled	9.00c.
SAE, 3100, cold-rolled, annealed	8.55c.
Floor plate, ¼ in. and heavier	5.90c.
Standard tool steel	12.50c.
Wire, black, annealed (No. 9)	4.25c.
Wire, galv. (No. 9)	4.60c.
Tire steel, 1 x ½ in. and larger	4.61c.
Open-hearth spring steel	4.75c. to 10.25c.
Common wire nails, base per keg	3.25c.

Per Cent Off List

Machine bolts, square head and nut:	
All diameters. Prices on application	
Carriage bolts, cut thread:	
All diameters. Prices on application	

*No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb.
†125 lb. and more.

ST. LOUIS Base per Lb.

Plates and struc. shapes	3.99c.
Bars, soft steel (rounds and flats)	4.09c.
Bars, soft steel (squares, hexagons, ovals, half ovals and half rounds)	4.24c.
Cold-fin. rounds, shafting, screw stock	4.54c.
Hot-rolled annealed sheets (No. 24)	4.84c.
Galv. sheets (No. 24*)	5.49c.
Hot-rolled sheets (No. 10)	4.09c.
Black corrug. sheets (No. 24*)	4.89c.
2 galv. corrug. sheets	5.54c.
Structural rivets	4.94c.
Boiler rivets	5.04c.

Per Cent Off List

Tank rivets, 7/16 in. and smaller	55
Machine and carriage bolts, lag screws, fitting up bolts, bolt ends, plow bolts, hot-pressed nuts, square and hexagon, tapped or blank, semi-finished nuts; all quantities	65

*No. 26 and lighter take special prices.

PHILADELPHIA

	Base Per Lb.
*Plates, ¼-in. and heavier	3.80c.
*Structural shapes	3.80c.
*Soft steel bars, small shapes, iron bars (except bands)	3.90c.
†Reinforc. steel bars, sq. twisted and deformed	3.43c.
Cold-finished steel bars	4.53c.
*Steel hoops	4.25c.
*Steel bands, No. 12 and 3/16 in. incl.	4.00c.
Spring steel	5.40c.
†Hot-rolled anneal. sheets (No. 24)	4.65c.
†Galvanized sheets (No. 24)	5.30c.
*Hot-rolled annealed sheets (No. 10)	3.90c.
Diam. pat. floor plates, ¼ in.	5.45c.

These prices are subject to quantity differential except on reinforcing and Swedish iron bars.

*Base prices subject to deduction on orders aggregating 4000 lb. or over.

†For 25 bundles or over.

‡For less than 2000 lb.

CLEVELAND

	Base per Lb.
Plates and struc. shapes	3.86c.

Soft steel bars	3.75c.
†Reinforc. steel bars	2.60c.
‡Cold-finished steel bars	4.30c.
Hot-rolled strip, 6 in. wide and under	4.16c.
Cold-finished strip	3.60c.
Hot-rolled annealed sheets (No. 24)	4.66c.
Galvanized sheets (No. 24)	5.31c.
Hot-rolled sheets (No. 10)	3.91c.
Hot-rolled 3/16 in. 24 to 48 in. wide sheets	3.91c.
Floor plates, 3/16 in. and heavier	5.76c.
*Black ann'l'd wire, per 100 lb.	\$3.40
*No. 9 galv. wire, per 100 lb.	3.80
*Com. wire nails, base per keg	2.95
	Per Cent Off List
Machine and carriage bolts, small	65 and 5
Large	60 and 10
Nuts, 100 count	65 and 5
½ in. and smaller	65 and 5
9/16 in. to 1 in.	60 and 10

†Outside delivery 10c. less.

*For 5000 lb. or less.

‡Plus switching and cartage charges and quantity differentials up to 50c.

CINCINNATI Base per Lb.

Plates and struc. shapes	3.95c.
Floor plates	5.85c.
Bars, rounds, flats and angles	4.05c.
Other shapes	4.20c.
Rail steel reinforc. bars	3.75c.
Hoops and bands, 3/16 in. and lighter	4.25c.
Cold-finished bars	4.50c.
Hot-rolled annealed sheets (No. 24) 3500 lb. or more	4.60c.
Galv. sheets (No. 24) 3500 lb. or more	\$5.25
Hot-rolled sheets (No. 10)	4.00c.
Small rivets	55 per cent off list
No. 9 ann'l'd wire, per 100 lb. (1000 lb. or over)	\$2.88
Com. wire nails, base per keg:	
Any quantity less than carload	3.04
Cement c't'd nails, base 100-lb. keg	3.50
Chain. lin. per 100 lb.	8.35

Net per 100 Ft.

Seamless steel boiler tubes,	
2-in.	\$21.80
4-in.	52.45
Lap-welded steel boiler tubes,	
2-in.	20.73
4-in.	48.41

BUFFALO Base per Lb.

Plates	3.92c.
Struc. shapes	3.80c.
Soft steel bars	3.90c.
Reinforcing bars	3.10c.
Cold-fin. flats and sq.	4.35c.
Rounds and hex.	4.35c.
Cold-rolled strip steel	3.79c.
Hot-rolled annealed sheets (No. 24)	4.80c.
Heavy hot-rolled sheets (3/16 in., 24 to 48 in. wide)	3.97c.
Galv. sheet (No. 24)	5.45c.
Bands	4.22c.
Hoops	4.22c.
Heavy hot-rolled sheets	3.97c.
Com. wire nails, base per keg:	
(2500-lb lots or under)	\$3.26
Black wire, base per 100 lb.	4.55c.
(Over 2500 lb.)	4.45c.

BOSTON Base per Lb.

Channels, angles	4.20c.
Tees and zeos, under 3"	4.45c.
H beams and shapes	4.07c.
Plates — Sheared, tank and univ. mill, ¼ thick and heavier	4.08c.
Floor plates, diamond pattern	6.03c.
Bar and bar shapes (mild steel)	4.20c.
Bands 3/16 in. thick and No. 12 ga. incl.	4.40 to 5.40
Half rounds, half ovals, ovals and bevels	5.45c.
Tire steel	5.45c.
Cold-rolled strip steel	3.845c.
Cold-finished rounds, squares and hexagons	4.65c.
Cold-finished flats	4.65c.
Blue annealed sheets, No. 10 ga.	3.90c.
One pass cold-rolled sheets No. 24 ga.	4.50c.
Galvanized steel sheets, No. 24 ga.	5.05c.
Lead coated sheets, No. 24 ga.	6.15c.

Price delivered by truck in metropolitan Boston, subject to quantity differentials.

DETROIT

Base per Lb.

Soft steel bars	3.94c.
Structural shapes	3.95c.
Plates	3.95c.
Floor plates	5.85c.
Hot-rolled annealed sheets	
(No. 24)*	4.69c.
Hot-rolled sheets (No. 10)	3.94c.
Galvanized sheets (No. 24)*	5.40c.
Bands and hoops	4.19c.
Cold-finished bars	4.30c.
Cold-rolled strip	3.78c.
Hot-rolled alloy steel (S.A.E. 3100 Series)	6.44c.
Quantity differential on bars, plates, structural shapes, bands, hoops, floor plates and heavy hot-rolled: Under 100 lb., 1.50c. over base; 100 to 399 lb., base plus .50c.; 400 to 3999 lb. base; 4000 to 9999 lb., base less .10c.; 10,000 lb. and over, less .15c.	

* Under 400 lb., .50c. over base; 400 to 1499 lb., base; 1500 to 3499 lb., base less .10c.; 3500 lb. and over, base less .15c.

Prices delivered by truck in metropolitan Detroit, subject to quantity differentials covering shipment at one time.

Galvanized and hot-rolled annealed may not be combined to obtain quantity deductions.

MILWAUKEE

Base per Lb.

Plates and structural shapes..	3.86c.
Soft steel bars, rounds up to 8 in., flats and fillet angles...	3.96c.
Soft steel bars, squares and hexagons	4.11c.
Hot-rolled strip	4.21c.
Hot-rolled annealed sheets (No. 24)	4.71c.
Galvanized sheets (No. 24)	5.36c.
Cold-finished steel bars	4.41c.
Structural rivets (keg lots)	4.81c.
Boiler rivets, cone head (keg lots)	4.91c.
Track spikes (keg lots)	4.61c.
Track bolts (keg lots)	5.81c.
Black annealed wire (No. 6 to No. 9 incl.)	4.05c.
Com. wire nails and cement coated nails	
1 to 14 kegs	3.25c.

Per Cent Off List

Machine bolts and carriage bolts, 1/2x6 and smaller or shorter...	65
Larger and longer up to 1 in. diam.	60-5
1 1/4 in. and larger	60
Coach and lag screws	60-5
Hot-pressed nuts, sq. and hex. tapped or blank, 1-199 lb.	50
200 lb. and over:	
1/2 in. and smaller	65
9/16 to 1 in.	60-5
1 1/4 in. and over	50-10

Prices given above are delivered Milwaukee.

On plates, shapes, bars, hot-rolled strip and heavy hot-rolled sheets, the base applies on orders of 400 to 3999 lb. On galvanized and No. 24 hot-rolled annealed sheets the prices given apply on orders of 400 to 1500 lb. On cold-finished bars the prices are for orders of 1000 lb. or more of a size.

ST. PAUL

Base per Lb.

Mild steel bars, rounds	4.10c.
Structural shapes	4.00c.
Plates	4.00c.
Cold-finished bars	4.55c.
Hot-rolled annealed sheets, No. 24	4.85c.
Galvanized sheets, No. 24	5.50c.

On mild steel bars, shapes and plates the base applies on 400 to 14,999 lb. On hot-rolled sheets, galvanized sheets and cold-rolled sheets base applies on 15,000 lb. and over. Base on cold-finished bars is 1000 lb. and over of a size.

BALTIMORE

Base per Lb.

Mild steel bars and small shapes	4.00c.
Structural shapes	3.90c.
Reinforcing bars, 5 to 15 tons.	3.16c.
Plates	3.90c.
Hot-rolled sheets, No. 10	3.95c.
Bands	4.20c.
Hoops	4.45c.
Special threading steel	4.15c.
Checkered floor plates 1/4 in. and heavier	5.80c.
Galvanized sheets, No. 24, 100 bds. or more	\$4.70
Cold-rolled rounds, hexagons, squares and flats, 1000 lb. and more	\$4.50

On plates, shapes, bars, hot-rolled strip and heavy hot-rolled sheets the base applies on orders 400 to 3999 lb. All prices are f.o.b. consumers' plants.

For second zone add 10c. per 100 lb. for trucking.

CHATTANOOGA

Base per Lb.

Mild steel bars	3.96c.
Iron bars	3.96c.
Reinforcing bars	3.96c.
Structural shapes	4.01c.
Plates	4.01c.
Hot-rolled sheets No. 10	3.91c.
Hot-rolled annealed sheets, No. 24*	4.06c.
Galvanized sheets No. 24*	4.76c.
Steel bands	4.16c.
Cold-finished bars	4.86c.

* Plus mill item extra.

MEMPHIS

Base per Lb.

Mild steel bars	4.31c.
Shapes, bar size	4.31c.
Iron bars	4.31c.
Structural shapes	4.21c.
Plates	4.21c.
Hot-rolled sheets, No. 10	4.26c.
Hot-rolled annealed sheets, No. 24	4.91c.
Galvanized sheets, No. 24	5.66c.
Steel bands	4.56c.
Cold-drawn rounds	4.80c.
Cold-drawn flats, squares, hexagons	6.80c.
Structural rivets	4.35c.
Bolts and nuts, per cent off list	55
Small rivets, per cent off list	60

NEW ORLEANS

Base per Lb.

Mild steel bars	4.20c.
Reinforcing bars	3.24c.
Structural shapes	4.10c.
Plates	4.10c.
Hot-rolled sheets, No. 10	4.35c.
Steel bands	4.75c.
Cold-finished steel bars	5.10c.
Structural rivets	4.85c.
Boiler rivets	4.85c.
Common wire nails, base per keg	\$3.30
Bolts and nuts, per cent off list	60

PACIFIC COAST

Base per Lb.

	San Francisco	Los Angeles	Seattle
Plates, tank and U. M.	4.05c.	4.30c.	4.25c.
Shapes, standard	4.05c.	4.30c.	4.25c.
Soft steel bars..	4.20c.	4.30c.	4.45c.
Reinforcing bars, f.o.b. cars dock Pacific ports..	2.975c.	2.975c.	3.625c.
Hot-rolled annealed sheets (No. 24)	5.15c.	5.05c.	5.35c.
Hot-rolled sheets (No. 10)	4.30c.	4.50c.	4.50c.
Galv. sheets (No. 24 and lighter)	5.85c.	5.55c.	5.90c.
Galv. sheets (No. 22 and heavier)	6.10c.	5.70c.	5.90c.
Cold-finished steel Rounds	6.80c.	6.85c.	7.10c.
Squares and hexagons..	8.05c.	8.10c.	7.10c.
Flats	8.55c.	8.60c.	8.10c.
Common wire nails—base per keg less carload	\$3.65	\$3.60	\$3.70

All items subject to differentials for quantity.

REFRACTORIES PRICES

Fire Clay Brick

Per 1000 f.o.b. Works

First quality, Pennsylvania, Maryland, Kentucky, Missouri and Illinois	\$54.00
First quality, New Jersey	56.00
Select, Ohio	49.00
Second quality, Pennsylvania, Maryland, Kentucky, Missouri and Illinois	49.00
Second quality, New Jersey	51.00
No. 1, Ohio	46.00
Ground fire clay, per ton	8.00
5 per cent trade discount on fire clay brick, except for New Jersey, quoted at net price.	

Silica Brick

Per 1000 f.o.b. Works

Pennsylvania	\$54.00
Chicago District	63.00
Birmingham	54.00
Silica cement per net ton (Eastern)	9.50
5 per cent trade discount on silica brick.	

Chrome Brick

Per Net Ton

Standard f.o.b. Baltimore, Plymouth Meeting and Chester	\$49.00
Chemically bonded f.o.b. Baltimore, Plymouth Meeting and Chester, Pa.	49.00

Magnesite Brick

Per Net Ton

Standard f.o.b. Baltimore and Chester, Pa.	\$69.00
Chemically bonded, f.o.b. Baltimore	59.00

Grain Magnesite

Per Net Ton

Imported, f.o.b. Baltimore and Chester, Pa. (in sacks)	\$45.00
Domestic, f.o.b. Baltimore and Chester, in sacks	43.00
Domestic, f.o.b. Chewelah, Wash.	25.00

RAW MATERIALS PRICES

PIG IRON

No. 2 Foundry

F.o.b. Everett, Mass.	\$25.75
F.o.b. Bethlehem, Birdsboro and Swedeland, Pa., and Sparrows Point, Md.	25.00
Delivered Brooklyn	27.27
Delivered Newark or Jersey City	26.39
Delivered Philadelphia	25.76
F.o.b. Neville Island, Sharpsville and Erie, Pa.; Buffalo, Youngstown, Cleveland, Toledo and Hamilton, Ohio; Detroit; Chicago and Granite City, Ill.	24.00
F.o.b. Jackson, Ohio	25.75
Delivered Cincinnati	24.07
F.o.b. Duluth	24.50
F.o.b. Provo, Utah	22.00
Delivered San Francisco, Los Angeles or Seattle	25.00
F.o.b. Birmingham*	20.38

* Delivered prices on southern iron for shipment to northern points are 88c a ton below delivered prices from nearest northern basing point on iron with phosphorus content of 70 and over.

Malleable

Base prices on malleable iron are 50c a ton above No. 2 foundry quotations at Everett, Eastern Pennsylvania furnaces, Erie and Buffalo. Elsewhere they are the same.

Basic

F.o.b. Everett, Mass.	\$25.75
F.o.b. Bethlehem, Birdsboro, Swedeland and Steelton, Pa., and Sparrows Point, Md.	24.50
F.o.b. Buffalo	23.00
F.o.b. Neville Island, Sharpsville and Erie, Pa.; Youngstown, Cleveland, Toledo and Hamilton, Ohio; Detroit; Chicago and Granite City, Ill.	23.50
Delivered Cincinnati	24.51
Delivered Canton, Ohio	24.76
Delivered Mansfield, Ohio	25.26
F.o.b. Jackson, Ohio	25.50
F.o.b. Birmingham	19.00

Bessemer

F.o.b. Everett, Mass.	\$26.75
F.o.b. Bethlehem, Birdsboro and Swedeland, Pa.	26.00
Delivered Boston Switching District	26.50
Delivered Newark or Jersey City	27.39
Delivered Philadelphia	26.76
F.o.b. Buffalo and Erie, Pa., and Duluth	25.00
F.o.b. Neville Island and Sharpsville, Pa.; Youngstown, Cleveland, Toledo and Hamilton, Ohio; Detroit; Chicago..	24.50
F.o.b. Birmingham	25.50
Delivered Cincinnati	25.51
Delivered Canton, Ohio	25.76
Delivered Mansfield, Ohio	26.26

Low Phosphorus

Basing points: Birdsboro, Pa., Steelton, Pa., and Standish, N. Y.	\$28.50
---	---------

Gray Forge

Valley or Pittsburgh furnace	\$23.50
------------------------------	---------

Charcoal

Lake Superior furnace	\$27.00
Delivered Chicago	30.04

Canadian Pig Iron

Per Gross Ton

Delivered Toronto	
No. 1 fdy., sil. 2.25 to 2.75	\$26.50
No. 2 fdy., sil. 1.75 to 2.25	25.50
Malleable	26.00
Basic	25.50
Delivered Montreal	
No. 1 fdy., sil. 2.25 to 2.75	\$27.50
No. 2 fdy., sil. 1.75 to 2.25	27.00
Malleable	27.50
Basic	27.00

FERROALLOYS

Ferromanganese

F.o.b. New York, Philadelphia, Baltimore, Mobile or New Orleans.	
Per Gross Ton	
Domestic, 80% (carload)	\$102.50

Spiegeleisen

Per Gross Ton Furnace	
Domestic, 19 to 21%	\$33.00
F.o.b. New Orleans	33.00

Electric Ferrosilicon

Per Gross Ton Delivered	
50% (carloads)	\$69.50
50% (ton lots)	77.00
75% (carloads)	126.00
75% (ton lots)	136.00

Silvery Iron

Per Gross Ton	
F.o.b. Jackson, Ohio, 5.00 to 5.50%	\$27.50

For each additional 0.5% silicon up to 17%. 30c. a ton is added.
The lower all-rail delivered price from Jackson or Buffalo is quoted with freight allowed. Base prices at Buffalo are \$1.25 a ton higher than at Jackson.

Manganese, each unit over 2%, \$1 a ton additional. Phosphorus 0.75% or over, \$1 a ton additional.

Bessemer Ferrosilicon

F.o.b. Jackson, Ohio, Furnace	
Per Gross Ton	
10.00 to 10.50%	\$33.50
10.51 to 11.00%	34.00
11.01 to 11.50%	34.50
11.51 to 12.00%	35.00
12.01 to 12.50%	35.50
12.51 to 13.00%	36.00
13.01 to 13.50%	36.50
13.51 to 14.00%	37.00
14.01 to 14.50%	37.50
14.51 to 15.00%	38.00
15.01 to 15.50%	38.50
15.51 to 16.00%	39.00
16.01 to 16.50%	39.50
16.51 to 17.00%	40.00

Manganese 2 to 3%, \$1 a ton additional. For each unit of manganese over 3%, \$1 a ton additional. Phosphorus 0.75% or over, \$1 a ton additional.

Base prices at Buffalo are \$1.25 a ton higher than at Jackson.

Other Ferroalloys

Ferrotungsten, per lb. contained W del., carloads	\$1.70
Ferrotungsten, lots of 5000 lb.	\$1.75
Ferrotungsten, smaller lots	\$1.80
Ferrochromium, 4 to 6% carbon and up, 65 to 70% Cr per lb. contained Cr delivered, in carloads, and contract	10.50c.*
Ferrochromium, 2% carbon	16.50c. to 17.00c.*
Ferrochromium, 1% carbon	17.50c. to 18.00c.*
Ferrochromium, 0.10% carbon	19.50c. to 20.00c.*
Ferrochromium, 0.06% carbon	20.00c. to 20.50c.*
Ferrovandium, del. per lb. contained V.	\$2.70 to \$2.90
Ferrocolumbium, per lb. contained columbium, f.o.b. Niagara Falls, N. Y.	\$2.50*
Ferrocobaltitanium, 15 to 18% Ti, 7 to 8% C, f.o.b. furnace carload and contract per net ton	\$142.50
Ferrocobaltitanium, 17 to 20% Ti, 3 to 5% C, f.o.b. furnace, carload and contract, per net ton	\$157.50
Ferrophosphorus, electric, or blast furnace material, in carloads, f.o.b. Anniston, Ala., for 18%, with \$3 unitage, freight equalized with Rockdale, Tenn., per gross ton	63.50
Ferrophosphorus, electric, 24%, in carlots, f.o.b. Anniston, Ala., per gross ton with \$3 unitage, freight equalized with Nashville, Tenn.	80.00
Ferromolybdenum, per lb. Mo del.	95c.
Calcium molybdate, per lb. Mo del.	80c.
Silico spiegel, per ton, f.o.b. furnace, carloads	\$45.00
Ton lots or less, per ton	50.00
Silico-manganese, gross ton, delivered.	
3%	101.50
2.50% carbon grade	106.50
2% carbon grade	111.50
1% carbon grade	121.50

* Spot prices are \$5 a ton higher. Spot premium on 75 per cent ferrosilicon is \$10 a ton.

ORES

Lake Superior Ores

Delivered Lower Lake Ports	
Per Gross Ton	
Old range, Bessemer, 51.50%	\$5.25
Old range, non-Bessemer, 51.50%	5.10
Mesabi, Bessemer, 51.50%	5.10

Mesabi, non-Bessemer, 51.50%	\$4.95
High phosphorus, 51.50%	4.85

Foreign Ore

C.i.f. Philadelphia or Baltimore

Per Unit	
Iron, low phos., copper free, 55 to 58% dry, Algeria, nominal	17.00c.
Iron, low phos., Swedish, average, 68 1/4% iron	Nominal
Iron, basic or foundry, Swedish, aver. 65% iron	Nominal
Iron, basic or foundry, Russian, aver. 65% iron	Nominal
Man., Caucasian, washed	
52%	47c.
Man., African, Indian, 44-48%	Nominal
Man., African, Indian, 49-51%	Nominal
Man., Brazilian, 46 to 48 1/2%	Nominal

Per Net Ton Unit

Tungsten, Chinese, wolframite, duty paid delivered nominal	\$23.50 to \$25.50
Tungsten, domestic, scheelite delivered	Nominal
Chrome ore (lump) c.i.f. Atlantic Seaboard, per gross ton: South African (low grade)	\$16.00
Rhodesian, 45%	23.00
Rhodesian, 48%	26.50
Turkish, 48-49%	25.50 to \$26.50
Turkish, 45-46%	23.50 to 24.00
Turkish, 44%	19.00 to 19.50
Chrome concentrates (Turkish) c.i.f. Atlantic Seaboard, per gross ton: 50%	\$24.50 to \$25.00
48-49%	25.50 to 26.50

FLUORSPAR

Per Net Ton	
Domestic, washed gravel, 85-5, f.o.b. Kentucky and Illinois mines, all rail	\$20.00
Domestic, barge and rail	\$19.50 to 21.50
No. 2 lump, 85-5, f.o.b. Kentucky and Illinois mines	21.00
Foreign, 85% calcium fluoride, not over 5% silicon, c.i.f. Atlantic ports, duty paid	24.50
Domestic No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2 1/4% silicon, f.o.b. Illinois and Kentucky mines	35.00

FUEL OIL

Per Gal.	
F.o.b. Bayonne or Baltimore, No. 3 distillate	5.25c.
F.o.b. Bayonne or Baltimore, No. 4 industrial	5.25c.
Del'd Ch'go, No. 3 industrial	4.15c.
Del'd Ch'go, No. 5 industrial	4.00c.
Del'd Cleve'd, No. 3 distillate	5.75c.
Del'd Cleve'd No. 4 industrial	5.75c.
Del'd Cleve'd No. 5 industrial	5.00c.

COKE AND COAL

Coke	Per Net Ton
Furnace, f.o.b. Connells-ville, Prompt	\$4.35 to \$4.60
Foundry, f.o.b. Connells-ville, Prompt	5.00 to 6.25
Foundry, by-product, Chicago ovens	10.25
Foundry, by-product, del'd New England	12.50
Foundry, by-product, del'd Newark or Jersey City	10.85 to 11.30
Foundry, by-product, Philadelphia	10.60
Foundry, by-product, delivered Cleveland	11.00
Foundry, by-product, delivered Cincinnati	10.50
Foundry, by-product, del'd St. Louis industrial district	11.00 to 11.50
Foundry, from Birmingham, f.o.b. cars docks, Pacific ports	14.75
Coal	Per Net Ton
Mine run steam coal, f.o.b. W. Pa. mines	\$1.50 to \$1.75
Mine run coking coal, f.o.b. W. Pa.	1.75 to 1.90
Gas coal, 3/4-in. f.o.b. Pa. mines	2.00 to 2.25
Mine run gas coal, f.o.b. Pa. mines	1.80 to 2.00
Steam slack, f.o.b. W. Pa. mines	1.00 to 1.25
Gas slack, f.o.b. W. Pa. mines	1.20 to 1.45



For
High Quality
STEELS

NIAGARA

BRAND

FERRO-ALLOYS

FERRO SILICON
ALL GRADES

FERRO CHROMIUM
HIGH CARBON

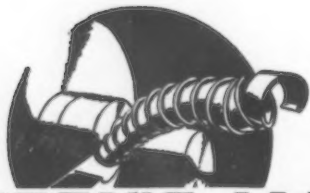
FERRO CHROMIUM
LOW CARBON

FERRO MANGANESE
SILICO MANGANESE

PITTSBURGH METALLURGICAL CO., Inc.

NIAGARA FALLS, N.Y.

Sales Offices: NEW YORK—30 Church St. • PITTSBURGH—Oliver Bldg. • CLEVELAND—Hanna Bldg.



THIS WEEK'S MACHINE ...TOOL ACTIVITIES...

... *Buying and inquiries well sustained as strike news clarifies.*

o o o

... *Tractor builders are engaged in programs.*

o o o

... *June and early part of July see further price increases ranging up to 10 per cent.*

Chicago

INQUIRIES, which for the past several weeks have been for small lots of tools, usually only one or two each, have abruptly reversed their course in the past seven days and are now being received for lists from a variety of manufacturers. One explanation of this diversion of business from small to large lots is that the apparent weakening of the CIO movement is causing a renewal of confidence, and larger buyers are re-entering the market. Consumption by the agricultural implement industry has been good, particularly from the International Harvester Co. tractor works here. The Crane Co., and the J. I. Case Co. are said to be contemplating new buying programs. Allis-Chalmers is reported to have some plans out for a new tractor motor, definite information about which is not available. The resumption of buying upon the easing of the labor situation is expected by at least one seller to attain such proportions that some of the announced vacation schedules may be postponed, so great will be the rush of new business.

Cleveland

MACHINERY sales picked up moderately here last week on the strength of one or two quietly executed purchases. Complete tool room equipment, involving 15 to 20 machines, was bought by General Electric Co. for its Trumbull Lamp Works division at Warren, Ohio, and orders were likewise placed here for a lot of 10 to 12 units by the Aluminum Co. of America. These machines will be shipped across the continent to equip a West Coast plant of the latter. The Chesapeake & Ohio railroad is expected to close shortly for 10 to 15 machines, including grinders, shapers and lathes, on which it has already been quoted. No other attractive lots are pending at the moment, though new business continues to turn up

spasmodically. Machine tool manufacturers have as yet made no appreciable dent in order backlogs, and deliveries remain well extended. Makers of horizontal boring mills, whose limited capacity has been heavily taxed by the recent buying wave, are generally unable to quote additional business for shipment before late January, to cite a specific case. Some manufacturers of this type of equipment have increased prices about 10 per cent, effective since July 1. Increases have been announced, effective July 1, or July 15, by certain manufacturers of riveting equipment, precision lathes and milling machines, these advances ranging between 7 and 10 per cent. One manufacturer of surface grinders has advanced the price of his product by about 5 per cent since the close of June, and on June 1 an important forging machine manufacturer raised prices approximately 10 per cent.

Cincinnati

THE local machinery market tends easier than during the spring months. Ordering is slower, but steady. Some shift in source is noted as business tends lighter from areas affected by labor disturbances, but is unabated in other districts. Foreign demand is reported to be good and business is from both European and Asiatic users. Current ordering the past week was about on a parity with the preceding week, allowing for the holiday period. Inquiry is steadily active and reflects an unabated interest in tools. A smattering of automobile orders is reported, but the extent of this business is not impressive. Milling and grinding machinery are most active in the present market.

Production is holding to the level of the last four months since manufacturers desire reduction of present backlogs. Shipments are closer to consumer requirements although improvement is currently sought. Labor conditions are quiet.

Pittsburgh

INQUIRIES continue strong and if anything are in slightly better volume than a week ago. Total orders show little change from recent levels and, in view of the season, they are considered satisfactory. Although the amount of business being placed is not as large as the records made several months ago, it has the characteristics of a normal volume which represents actual and immediate needs. With delivery becoming further extended, orders reaching manufacturers in the aggregate are ahead of shipments. As yet no general price increases have been announced but a few manufacturers within the past three weeks have put through adjustments averaging 10 per cent. In most cases these adjustments apply on equipment, deliveries for which are extended several months. Some manufacturers, as noted in previous reports, are not quoting prices on some machine tools which are booked ahead for several months. Meanwhile, steel mill equipment manufacturers continue exceptionally busy and recent business placed, both for domestic and foreign interests, precludes any downward trend for quite some time. Inquiries for machine tools for the Pittsburgh-Corning Corp. building at Port Allegany, Pa., have not made their appearance as yet. The plant will manufacture glass bricks.

New York

FROM all reports July will turn out to be a quiet month in machine tool business, as gaged by the orders booked last week. With one exception, dealers reported a falling off in inquiries, but the volume of quotations is still far from low. Some improvement is noted in delivery promises, as orders begin to fall below shipments. Occasionally one hears of rapid revisions in schedules wherein a machine promised for September was shipped the last of June, but the explanation lies in the sidetracking of some other unit for lack of parts supplied on the outside. Bearing deliveries are slow, and there have been labor difficulties in foundries. Machines made of rolled steel have also felt the uncertainties occasioned by strike difficulties in steel mills and the previously existing condition of long deliveries on plates. Six months is pretty much average on many machines, so that the promise of six weeks delivery on certain sizes of radial drills mentioned by one vendor, is news. At best improvement in deliveries is spotty.

The continued price rise seems to have reached a temporary halt. Some price announcements were made in late May, and other announcements became effective June 15 and July 1. The feeling is that prices have leveled off and that most increased labor costs have been discounted. A hidden cost not revealed in wage rates is the more independent and leisurely attitude assumed by the workers, who set their own pace regardless of the desires of management.